MOTOR AGE

Vol. XXXII
No. 10

CHICAGO, SEPTEMBER 6, 1917

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Three dollars a year

U.S. Ball Bearings
In the Farm Tractor

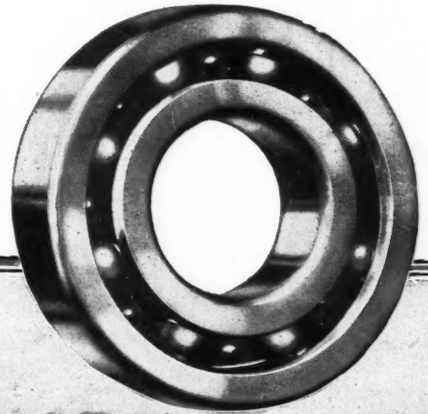
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MOTOR AGE

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NEXT WEEK.

Next week's issue will be published on Sept. 13th, and to commemorate the date holders of car license No. 13 in the various states will constitute the feature of MOTOR AGE for that issue. Are you a knight of the thirteenth car, or is thirteen a dragon of supersition for you? In either case be sure to read this.

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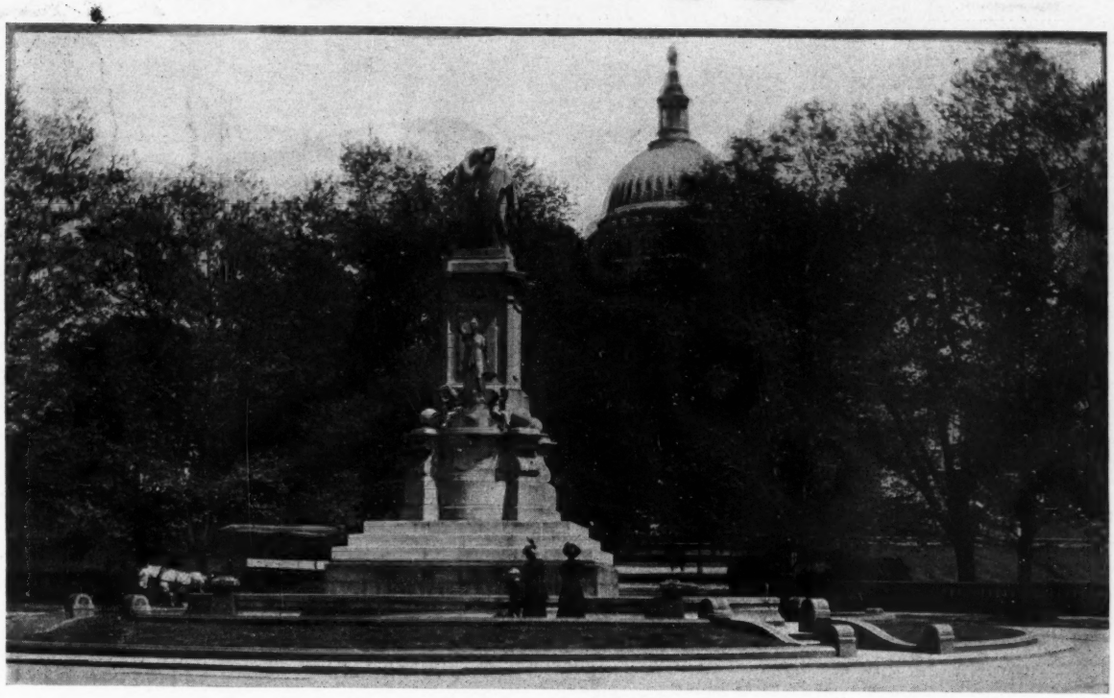
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Vol. XXXII, No. 10 Chicago, September 6, 1917 $3.00 Per Year

MOTOR AGE



View of peace monument which stands at the head of Pennsylvania avenue and just in front of the capitol building at Washington, D. C.

The Capital Tour

by Eleanor E. Day

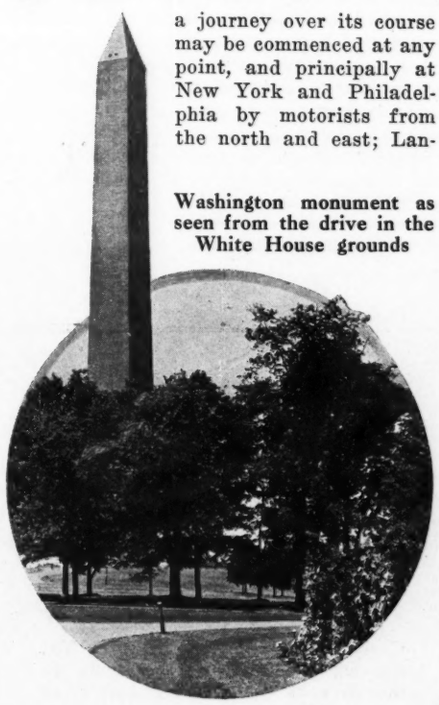
WENDING its fair, even way from the shores of the Hudson river at New York City into the heart of historic Virginia, home of romance and garden of scenic loveliness, the Capital Tour, three years in the making, now offers motor tourists one of the most fascinating short journeys yet to appear in the wake of the ubiquitous motor car.

Included in this new, and now fully organized, tour are five great American cities—New York, Philadelphia, Washington, Baltimore and Richmond—and innumerable smaller cities, towns and hamlets, most of which are familiar by name to every person who has read the story of North America.

Battlefields Seen Often on Route

Along the route of the Capital Tour may be seen battlefields that will live forever in the pages of United States history, wonders without equal in all the land, quaint old towns teeming with lore of by-gone days, valleys fair and fertile, mountains great and grand, ocean, bay, lake, river and stream—brooks that fairly sing out to you as they leap and tumble on their way.

Inasmuch as the Capital Tour has the characteristics of an around-the-circle trip, a journey over its course may be commenced at any point, and principally at New York and Philadelphia by motorists from the north and east; Lancaster or Gettysburg by those from the west; and Richmond and Lynchburg by tourists from the south.



Washington monument as seen from the drive in the White House grounds

In its course the Capital Tour traverses some of the finest stretches of highway in the United States, particularly the wonderful Lancaster pike, the far-famed Shenandoah valley road, and the Washington-Baltimore boulevard. The poorest stretch of roadway is that extending from Staunton to Richmond—but this is only poor by comparison. The entire trip may be made comfortably in one week's time, but a whole summer could be enjoyably spent rambling over its length.

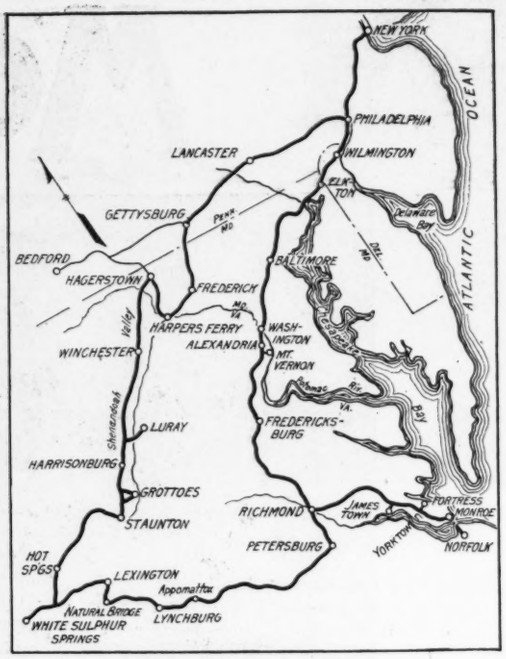
Philadelphia Prolific in Interest

Starting at the always interesting, startling and unequalled American metropolis, with its untold measure of human joy and sorrow, brightly-lighted highways and shady byways, the tourist crosses the Hudson siver to Jersey City, thence to Newark, New Brunswick, Princeton, Trenton and on to Philadelphia.

An attempt to tell what there is of interest to be seen in the City of Brotherly Love would be futile; suffice to say that there are many places and things which are without duplicate in the wide world,



One of the charming wayside scenes enroute to Richmond



Map of the capital tour

and the first-time visitor of curious mind may spend many happy days rambling among the old town's ancient and modern buildings, while its pretty parks, and beautiful suburban estates make strong appeal to all.

From Philadelphia the Capital Tour leads on to Bryn Mawr, Lancaster, York, and Gettysburg, where, of course, a stop should be made to visit the Gettysburg battlefield. Here was fought what was practically the deciding conflict of the Civil War. The battleground covers about 25 square miles and all important parts of it have been marked by the Gettysburg Battlefield Memorial Association. It is estimated that there are more than 400 monuments now on the field, upon which $7,000,000 have been expended in making it attractive.

An Entrancing Ride

The next place of interest is Frederick, Md. During the Civil War this little town was occupied on different occasions by Unionists and Confederates, and is famous as the home of Barbara Frietchie. Francis Scott Key is buried here, and at the entrance of Mount Olivet cemetery stands a handsome monument erected to his memory. Frederick was also the starting point, in 1755, of General Braddock's ill-fated expedition against the French at Fort Duquesne.

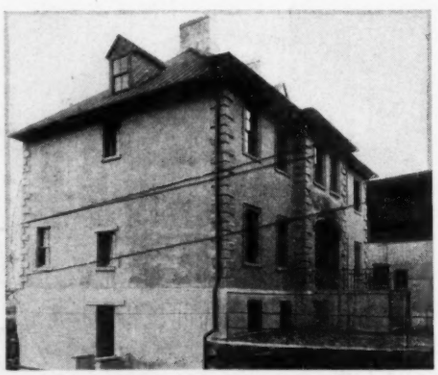
Departing from Frederick, en route to Harpers Ferry and Hagerstown, the tourist begins one of the most entrancing motor rides to be experienced anywhere. Emerging from this rich, green farming land of the Monocacy, the ascent of historic South Mountain is begun over the most delightful of roads. Gaining the top of the mountain a stop is made to read the long row of tablets placed there to inform the passer-by of the battles once waged on its crest.

Then comes an exhilarating ride down into the valley below, and on to Harpers Ferry, scene of the exploits of the notorious John Brown, and the meeting place of the waters of the Potomac and Shenandoah rivers. From the city's heights one obtains a view unrivalled in beauty, and one not soon forgotten.

Between Harpers Ferry and Hagerstown the road runs alongside the Antietam battlefield, where was fought the bloodiest battle of the memorable war between the North and the South. For several miles the roadway is lined with tablets, monuments and old cannon, and here, when the snapping of scenes begins, the average tourist usually forgets that kodak film costs real money.

Hagerstown, formerly one of the most important stations on the old Cumberland road, is usually selected as a night stop. It was here that General Lee concentrated his forces before the battle of Gettysburg, and it is here that the long blissful ride down the Shenandoah valley pike begins.

It is but a short spin to Martinsburg, W. Va., a town rich in traditional lore, where occurred the wholesale destruction of railroad property by General "Stonewall" Jackson.



Carlyle House in Alexandria, Va., meeting place of notable men in the days of the Revolutionary War

After Martinsburg comes historic Winchester, where George Washington received his early training while serving under the British flag. Here may be seen a fort built by Washington in pre-Revolutionary days to protect the country against the French. Here also may be seen the one-time headquarters of Generals Sheridan and Jackson, and innumerable other interesting relics of other days.

Down the valley of Virginia goes the Capital Tour-ist, his car gliding over the smoothest of highways and through the fairest of scenes. To the right and to the left the entire country is blanketed with green, behind are pleasant memories, ahead a white, even road glistening in the sunshine like a great silken ribbon, and in the distance the Old Dominion's far-famed mountains, with the haze of blue hovering over them that gives their name the Blue Ridge mountains. Here is the Valley of Enchantment.

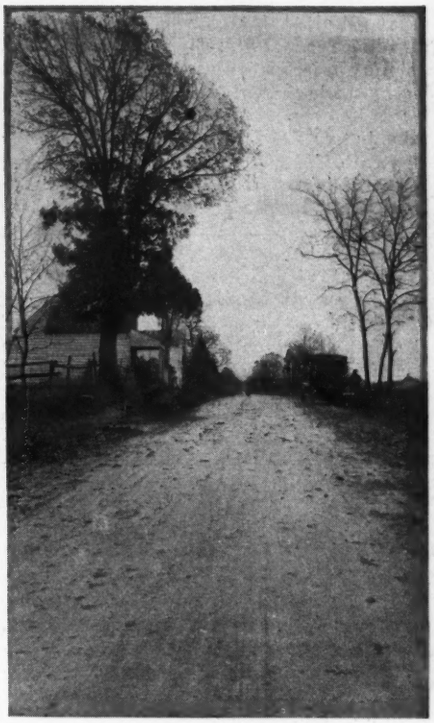
Caverns of Luray

The next stop of importance is at the Caverns of Luray, reached by a 14-mile side trip from Newmarket. The stalactitic display here exceeds that of any other cavern known. The old material is yellow, brown or red, and its wavy surface often shows layers like the gnarled grain of costly woods. The Empress Column is a stalagmite 35 ft. high, rose-colored and elaborately draped. Several stalactites in the Giant Hall exceed 50 ft. in length. The smaller pendants are innumerable. In the canopy above the Imperial Spring it is estimated that 40,000 are visible at once. Government records show that these caverns have been visited by more tourists than all the other caverns in the United States combined.

Leaving the caverns, the tourist soon reaches Harrisonburg, half-way point in the valley ride, and a delightful resting place. After one of those famed Virginia dinners at Harrisonburg the sightseer is ready for the Grottoes of the Shenandoah,



The old King's highway—now a government improved road through Alexandria to the nation's capitol. The scenic attractions are many



Throughout Maryland the road on this tour is similar to the stretch seen here

another Virginia wonder, discovered over a century ago by a wandering hunter. During the Civil War they were occupied by the contending armies which fought in their immediate vicinity. The Grottoes are reached by a side trip from Fort Defiance, just below Harrisonburg.

Staunton, birthplace of President Wilson, is the next town of consequence on the route. Then comes Hot Springs, Va., and White Sulphur Springs, W. Va., both nationally and internationally renowned for their curative properties, and the recreation places of noted people from every part of the world. It was at White Sulphur Springs that President and Mrs. Wilson spent their honeymoon.

Leaving the Springs, and passing through Covington, one of the marvels of the world soon comes into view—the Natural Bridge of Virginia. This is a bridge of natural rock, which spans Cedar Creek at a height of 215 ft. It is 90 ft. long, and from 50 to 150 ft. wide. The great rock has taken on the bloom of thousands of years of time, and is covered with lichens and fungi. It is crossed by a public road.

At this point but one-half of the Capital Tour has been covered, but the present high cost of paper, causing lack of space, compels a hurried survey of the balance of the trip, which here gains in interest, and therefore forces a carefully-measured description of the places visited.

In rapid succession come Lexington, Glasgow and Lynchburg, each well worth a visit, and then—Appomattox, where, with Lee's surrender to Grant, April 9, 1865, the Civil War was brought to a close. Here, in a locust grove at the right of the road, may be seen the ruins of the old Court House; also may be seen, in another locust grove, the spot where stood the McLean House, where Grant and Lee met to sign the terms of the surrender. The tablet showing the spot of Grant's headquarters is in a field off to the right. Beyond the Court House site the left fork leads to the spot where the respective leaders met to discuss terms. Continuing on this road, and just after crossing a brook, is the site of the old apple tree under which the heavy-hearted and gallant Lee rested while awaiting the return of the flag of truce sent to the Union leader.

It is a 124-mile ride through a rich vein of historic Virginia to Richmond, capital of the state, and the most fascinating city in all the South. Like Rome, Richmond is situated on seven hills, and its very sides bulge with relics of the past within its confines. From end to end it teems with stories of by-gone days, and it affords the visitor inside its gates unequalled hospitality and many joyful hours of sightseeing. To enumerate everything worth seeing and every place worth visiting is out of the question, but no one with a heart that beats to every episode in the history



Woodlawn, four miles from Mount Vernon, the home of Nellie Curtis, Washington's adopted daughter

of the United States will want to miss standing for a few precious moments in St. John's Episcopal Church where Patrick Henry made that great speech ending—

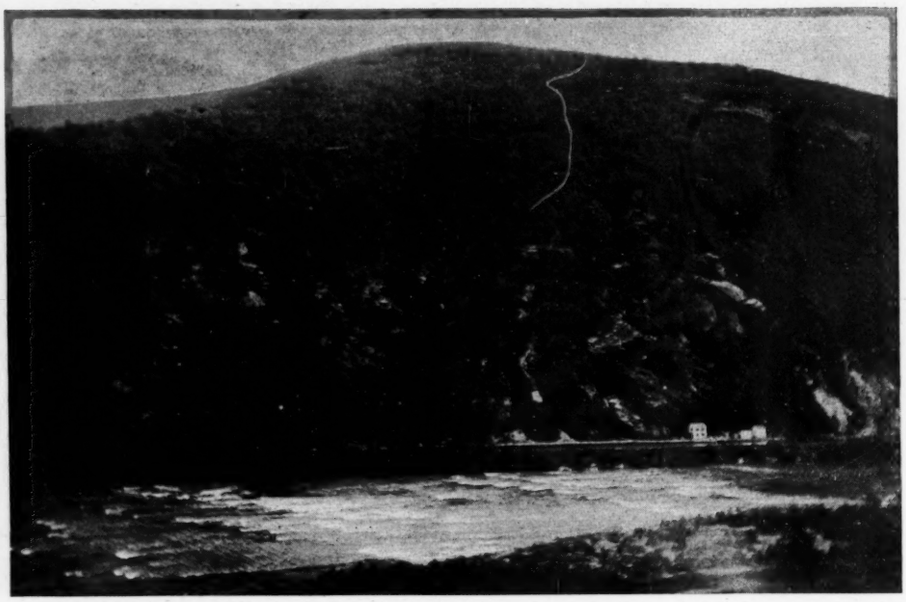
"I know not what course others may take, but as for me, give me liberty of give me death."

From Richmond it is another side trip to Norfolk, Virginia's second city, three times burned by the British, and possessing a wealth of historical landmarks; Ocean View and Virginia Beach, noted southern seaside resorts; Lake Drummond, a part of the Dismal Swamp; Jamestown, site of the first permanent English settlement in America, and where Pocahontas married John Rolfe in 1614; Williamsburg, oldest incorporated city in America, the road to which courses through the Seven Pines battlefield; Newport News, home of a mammoth ship-building plant; Fortress Monroe, located on renowned Hampton Roads, here was fought that memorable duel between the Monitor and the Merrimac, and where for two years Jefferson Davis was held a prisoner; Old Point Comfort, and, last but by no means least, Yorktown, where Lord Cornwallis surrendered to General Washington, thus bringing the Revolutionary War to a close, and establishing American independence.

North from Richmond

At Richmond the start north is commenced. It is 135 miles from the Virginia capital to the National capital, the route traversing Spottsylvania county, celebrated as containing several famous battlefields of the Civil War—Fredericksburg, Chancellorsville, the Wilderness, and particularly that of Spottsylvania Court House, where the armies of Grant and Lee contended for nearly two weeks. The first town of importance is Fredericksburg, where are located a 200-year-old burying ground, the former home of President Monroe, and the former home of John Paul Jones, first admiral of the American navy.

After Fredericksburg comes Occoquan, location of the District of Columbia's penal institute; Pohick Church, designed by Washington, and in whose yard lie many of the fair women and brave men who graced the King's Highway in early days, and whose names occupy prominent places in American history; Mount Vernon, where may be seen the former home of the Father of His Country and his tomb; Alexandria, where still stands the old Carlyle House, in which was held the council of governors with General Braddock; Christ Church, where Washington worshipped; the Wise Tavern, where the Birth-Night Balls were held, and where George and Martha Washington gracefully stepped the dignified minuet while without the watchman cried the hour just past, with "All's well and wintry weather."



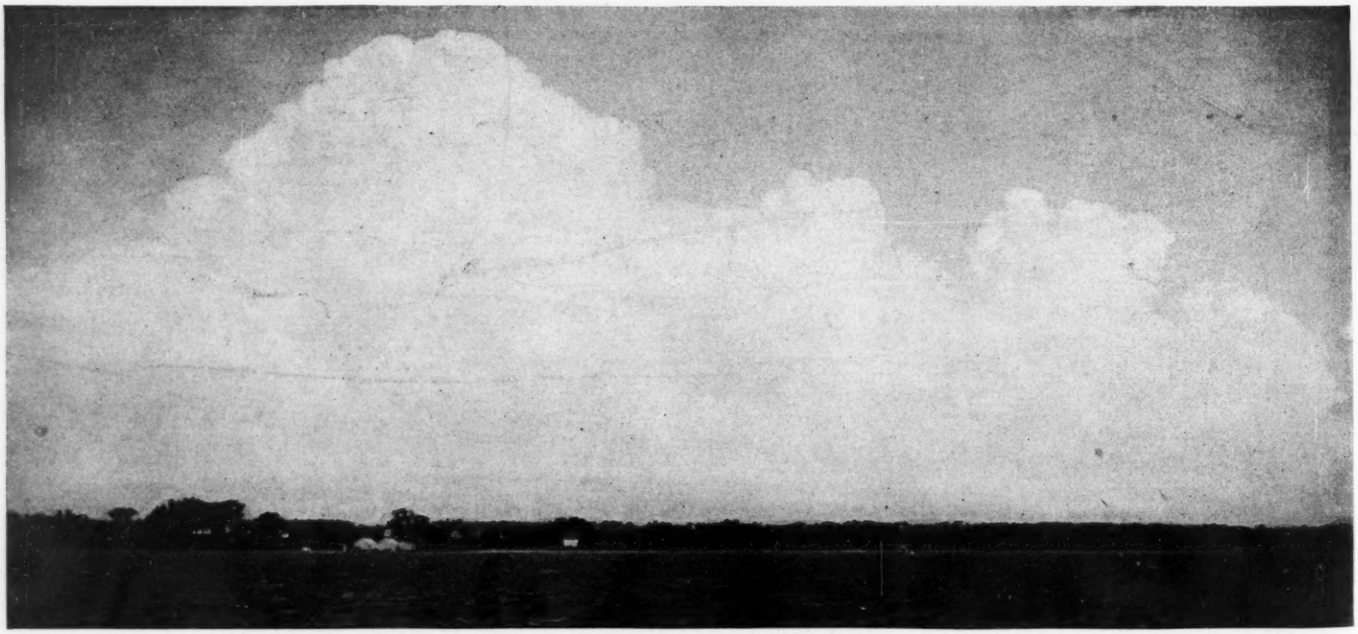
The Potomac river and a mountain scene from the heights above Harper's Ferry

It is just 14 miles from Alexandria to Washington, and here the tourist travels over a splendid Government-built highway that wends its way across the alluring Virginia hills, which always appear so beautiful from across the Potomac, and in which both President Wilson and former President Taft said they found so much comfort when perplexed.

An Inspiring Panorama

Just before descending from the hills the tourist will be impelled to stop and contemplate the panorama which lies before him. Below flow the placid waters of the historic Potomac, to the left tower the great government wireless stations at Arlington, while directly ahead looms the majestic Washington Monument, glorified by the rays of the setting sun. As a background to the great shaft are the imposing structures of official Washington, with the dome of the historic Capitol overshadowing all.

From this point the way to Washington is quite straight, and it is not long before the tourist enters the capital of the great nation which we are all pleased to call ours, but whose point of beginning was in that



Hampton Roads, scene of the famous battle between the Monitor and Merrimac. This is the gateway to Chesapeake Bay



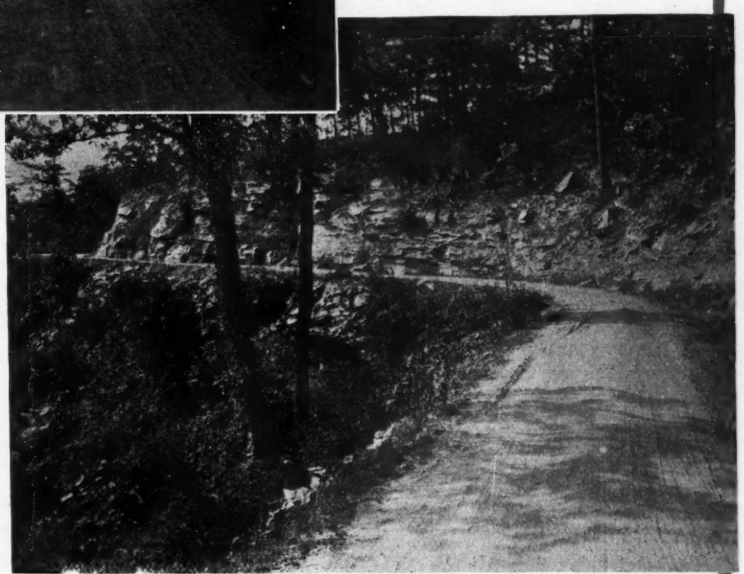
A view of the Shenandoah valley pike near Virginia grottoes with Blue Ridge mountains, four miles away, in the background



Section of road between Washington and Baltimore. This is a fine road



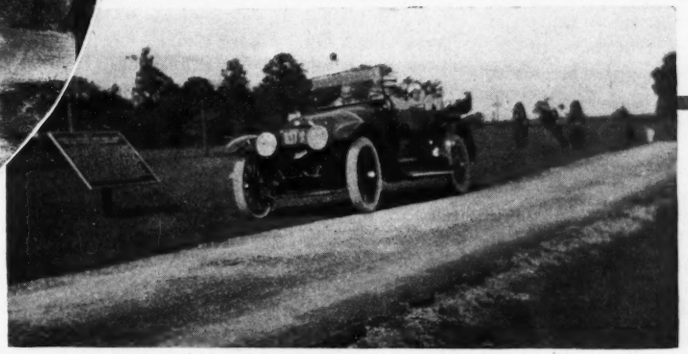
Where the turn is made from the Shenandoah pike, for the Grottoes 10 miles north of Staunton



One could hardly ask for roads better than this which winds through miles of most appealing country



Rustic scenes such as this frequently greet the eye enroute through Virginia



One of the cannons and one of the many tablets found along Bloody Lane, skirting Antietam battlefield

When the Nation Is at War Every Citizen Is at War

old Virginia town just left behind—Alexandria.

If the traveler wishes he can spend six months in Washington, and find a different entertainment each day of the time. It takes a guide book almost as thick as the New York City telephone directory to tell you of what there is to be seen there. If wishing to hurry on, giving the city only a cursory glance, he swings his car around the Washington Monument, passes the Bureau of Printing and Engraving, the White House, State War and Navy building, the Treasury, and then down Pennsylvania avenue past the Municipal building, the Office of Public Roads, the National Museum, the Botanical Gardens, the Capitol, the House Office Building, the Congressional Library, the Senate Office building, the Union Station, the Government Printing Office and into Maryland avenue, which in time leads to a big sign announcing the boulevard to Baltimore. From here the traveler may go direct to Baltimore and then to Annapolis, or first to the home of the United States Naval Academy, and then on to the Monumental city.

Few persons, of course, care to visit the Nation's Capital as hurriedly as outlined above, but much of it can be seen in a very short drive if satisfied with an exterior view of the buildings named.

It is forty miles from Washington to Baltimore, and most persons make the trip in 50 min. This statement may be slightly exaggerated, but it will serve to give an idea of the excellent road between the two cities.

Through Small Towns

The balance of the Capital Tour, from Washington back to New York, is through many small towns which are of small consequence from an interest-giving point of view; the larger towns on the way—Baltimore and Wilmington, Del., are, like Philadelphia, Washington, New York and Richmond, too large to be covered in this story. At this end of the trip the tourist finds more of the hum and bustle of modern industry and commerce; he misses the picturesque, the quaint, the historic and the all-pervading charm of that portion of the tour from Philadelphia around the circle to Washington. This is said, not because the writer believes that big cities and great commercial centers are devoid of interest, but in the belief that the average summer tourist is from the big city, and that in the quiet, peaceful valley of Virginia, or on old battlefields, or in poking among old landmarks associated with the early history of his country, he finds the charm and restfulness he seeks.

If this surmise is correct in your case, follow the above tour at your first opportunity. You'll never forget, and never regret.

PETARD DIRECTS FOUNDRY

New York, Sept. 3—Capt. Rene Petard, formerly chief engineer of the Mitchell-Lewis Motor Co., who was called to France in 1914, has been wounded and since his recovery has been placed in charge of a French government foundry.

Motors in Mexico Boom

Government Stands Sponsor for New Company Which Will Make Cars

Airplane Mail Routes Have Been Started

MONTEREY, Mexico, Sept. 1—Branch motor car and truck agencies are rapidly being established in many of the larger cities of Mexico by concerns that have their headquarters in San Antonio, El Paso and Laredo. Recently the Southern Motor Co. of El Paso sent a representative to the City of Mexico to open a branch establishment. It soon will locate other agencies in Chihuahua, Torreon and Aguas Calientes, it is reported here. The Southern Motor Co. handles the Republic trucks and the Chevrolet and Chalmers cars.

According to advices received here from Tampico, large shipments of motor trucks have arrived recently at that port by water from the United States for use in the different oil fields. In order that motor truck and car transportation in the Tampico region may be carried on successfully, modern highways are being constructed between the different towns and oil camps.

The Mexican government is standing sponsor for a company which has been organized at Monterey, capital of Neuva Leon, for the manufacture of motor cars. It is officially announced that it is believed the effort will prove successful.

The Carranza government is giving much attention to the introduction of the motor car into the various activities of the government, and airplane mail routes also have been established. The good roads question is being given special attention, and motor car travel is now possible in sections of the country where it was impossible for motor cars to go before.

Earl Cooper in Stutz Wins Race at Tacoma

TACOMA, Wash., Sept. 3—Special telegram—Two laps ahead of the nearest contender, Earl Cooper in his Stutz won the 100-mile army post special and $1,000 prize money on the Tacoma speedway this afternoon. Cliff Durant in a Chevrolet was second, Patterson in a Hudson third and Moosie in a Duesenberg fourth. Only five cars started and all finished except Crosby's Duesenberg. The race was under A. A. A sanction.

During the first ten laps the cars were bunched, Cooper leading except in one lap when Durant passed him. At the end of ten laps, Moosie nosed out Durant and Crosby, Durant being in fourth place. In the twelfth lap Cooper lapped Patterson, but a pit stop for a left front tire in the thirty-seventh lap cost Patterson second.

Moosie's Duesenberg gave Cooper's Stutz a hard battle until it blew a tire on a turn and spun around twice on the track and limped to the pits. Near the end of the race Cooper was two laps ahead of his closest rival. Durant took second money, $800, making the distance in 1:11:30. Patterson was third, winning $500, and Moosie fourth, winning $200.

In a challenge race of 25 miles between Durant and Patterson, Durant won, averaging 87 m.p.h. Durant's time was 17:54, and he finished about half a mile ahead of Patterson.

POSTOFFICE FOOD DELIVERY

Washington, D. C., Sept. 1—While the bill of Senator Hardwick of Georgia appropriating $100,000 for experiments by the Postoffice Department in motor truck delivery of articles of food direct from the producer to the consumer hardly will get favorable consideration from the House at the present special session of Congress, Senator Hardwick will push it there when the regular session begins in December.

This bill is along the lines of the extension of the parcel post system and in accordance with the food conservation program of the Federal government. Not only would Senator Hardwick have food products collected from the producer and delivered to the consumer, but he would have delivered by motor truck to the producers articles necessary in the production of such foods.

WEIDELY ENGINE FOR TRACTOR

Indianapolis, Sept. 4.—That tractors with Weidely overhead-valve engines are coming from Cleveland in quantities, is to be assumed from the statement that the Weidely Engine Co. has contracted to supply 5,000 four-cylinder engines per year for three years to the Cleveland Motor Plow Co., Cleveland, Ohio.

TEXAS REQUIRES ARMY LICENSES

Austin, Tex., Aug. 31—The Texas state highway commission will require registration numbers and distinguishing seals for the thousands of army trucks, officers' cars, motorcycles and sidecars that form a part of the equipment of the military posts and camps in Texas. This ruling came as a surprise to army officers, as the law provides that all army motor vehicles are exempt from the payment of the fees specified in the act. It is held by the Texas commission, however, that although no fee shall be charged for these vehicles, they must be registered, numbered and marked with distinguishing seals. Just how many army motor trucks and officers' cars there are in Texas at this time there is no means of knowing definitely, but they run well up into the thousands and are being augmented by the receipt of new shipments almost every day.

ZONE POSTAGE RATE THREATENED

Washington, D. C., Sept. 4—The war revenue bill as amended by Senator McKellar of Tennessee provides for second-class postage at the rate of from 2 to 6 cents a pound graduated by zones, beyond the 300-mile limit. The Sterling amendment to the

McKellar amendment exempts farm and religious papers and all periodicals maintained by religious, educational, scientific, philanthropic, agricultural, labor or fraternal organizations not organized for profit from the proposed new rates.

In this way 69 per cent of the total volume of second-class matter are exempted, as only a small percentage of newspapers circulate beyond the 300-mile limit, and the burden is thrown on the business papers and magazines, only 31 per cent of the volume of second class matter. Trade papers constitute about 4 per cent of the second class matter. Therefore, the tax if levied could not fail to work injustice on the business, or trade, papers and magazines. The bill is to be disposed of in the Senate Sept. 10 at 4 o'clock. After it passes the Senate it will go to conference for probably two or three weeks. Then all amendments to the House measure will be fought over again, the conclusions of the conference to go back to the two divisions for ratification.

STANDARD AERO BUYS PLANT

Plainfield, N. J., Aug. 31—Standard Aero Corp. has bought the John Stephenson Co. plant in Elizabeth, N. J., for $750,000 and is preparing to turn out sixty airplanes there each week. This will be one of the largest airplane plants where machines are made entirely under one roof. The Plainfield, N. J., plant for some time has been entirely inadequate. When the new plant is equipped there will be room for 6000 employes.

TIRES TO COST MORE

New York, Sept. 1—A general increase of tire prices is about to be started. Goodrich, Diamond, Firestone and Ajax have announced increases ranging from 10 to 15 per cent. Goodrich and Diamond casings have gone up 10 per cent, effective today, and Firestone truck tires are 15 per cent higher. Ajax will go up 10 per cent next Tuesday. The high cost of fabrics and other materials and the general increase of manufacturing costs is responsible.

United States and Fisk casings have increased 10 per cent. Tubes are not affected.

Tire prices started to ascend last December, when they rose 15 per cent. Since then they have risen another 15 per cent, in April, together with to-day's 10 per cent average, thus making a total of approximately 50 per cent since last year.

PEERLESS PRICES TO RISE

New York, Sept. 3—Peerless car prices are expected to advance about $250 on each model soon.

KOEHLER TRUCKS ARE HIGHER

Newark, N. J., Sept. 1—The Koehler Motor Corp. has increased the prices of its trucks from $995 to $1,150.

MURRAY PRICES INCREASE

New York, Aug. 31—The Murray Motor Car Co., Pittsburgh, Pa., will raise its prices Sept. 1 from $2,550 to $2,800 on the seven-passenger touring car, four passenger touring and roadster.

Ford Aids U.S. Red Cross

Half-Million Credit at Factory to Supplement Equipment Already on Front

Gift Includes Motor Cars, Ambulances and Accessories

WASHINGTON, D. C., Sept. 1—The American Red Cross is preparing to send to the western front in France many more ambulances as a result of a gift from the Ford Motor Co. in the form of credit to the extent of $500,000 at the Ford factories for motor cars, ambulances, parts, etc., as may be designated by the Red Cross.

In a statement issued by the Red Cross it is said the Ford gift can be used particularly well in supplementing its motor equipment not only on the western front, but also in Russia and Serbia. Despite the many ambulances now in service in France, many more can be used. The motor cars and accessories provided by the Ford gift also will be acceptable in providing equipment in places where such are needed badly in carrying out Red Cross programs.

Experiments on a new type of ambulance body now are being made by the Red Cross under the direction of the New York county chapter of that organization, the chief engineer of the New York Transportation Co. having offered his services in supervising this work.

A kitchen trailer designed by engineers of the New York county chapter is being used at the training camp at Allentown, Pa., and experts of the War Department are investigating this trailer with a view to adopting it for army purposes.

New York and Chicago Plan Further Races

CHICAGO, Sept. 5—Arrangements have been made for a contest between Ralph de Palma and Louis Chevrolet here Saturday. Immediately after the finish of the races Monday de Palma challenged Chevrolet, and Chevrolet has accepted.

In addition two other drivers have been invited to compete—Dave Lewis, whose Hoskins special took second place in the 100-mile event Labor day, and Gaston Chevrolet, Louis' brother, who finished close behind de Palma in the 20 and 50-mile races, driving the car in which Louis afterward won the 100-mile contest.

The program includes what many believe to be the four fastest racing cars in America and should provide some stirring tests of driving prowess, with possibly a new speed record or two.

There will be three races of 20, 30 and 50 miles. Fifty per cent of the gate receipts will go to the contestants, 40 per cent of this amount for first place, 30 per cent for second, 20 per cent for third, and 10 per cent for fourth. In this respect they will resemble the Labor Day program.

New York, Sept. 4—Racing at Sheepshead Bay speedway is expected to repeat the success of the races of Aug. 18, when paid admissions of $75,000 were taken in, with the staging of the Harkness Trophy race at 100 miles for a prize of $10,000 Sept. 22.

The Harkness trophy is one of the most prized trophies in racing now. Johnny Aitken is the present possessor of the trophy. Ralph de Palma, Louis Chevrolet, Ralph Mulford, Ira Vail and possibly Barney Oldfield are expected by the management to be among the starters.

The Harkness Trophy is one of a series of feature races for Sept. 22. There will be a handicap affair in which it is expected that de Palma, who defeated Chevrolet and Oldfield in a series of races Aug. 18, will start from scratch. The distance for this event has not been decided on as yet. Several short-distance races will be run. The 100-mile derby may be listed for that day.

FORTY-FIVE AMBULANCE BODIES

Washington, Sept. 1—Forty-five ambulance companies, organized by the American Red Cross, have been mustered into the Army medical corps, and most of them are on active service in this country. Those at Allentown, Pa., are training for service in France. The organization of these completes the probable needs of the American Red Cross in this particular field.

All the companies were organized by Red Cross chapters. Each consists of 124 men—a captain, four first lieutenants, two first-class sergeants, eleven sergeants, six corporals, one mechanic, three cooks and ninety-six privates. Four companies are assigned to service with each Army division, and the personnel may be used in whole or in part to man hospital trains, hospital ships or, where the need is great, emergency hospitals. The members of the companies have received first-aid training under the direction of the Red Cross. Eleven of the companies now are on duty at Allentown, Pa. Two companies have been assigned to Fort McPherson, one to Fort Oglethorpe, one to Butler, N. J., one with the Texas National Guard on the border, and the others are to be assigned with the National Army at the various cantonments.

CHEVROLET TO MAKE 1-TONNER

Detroit, Aug. 31—Though no announcement has been made as to when it will be placed on the market, plans are being made by the Chevrolet company to bring out a 1-ton truck with panel delivery body. The price will be $740.

SAXON FOUR AGAIN $395

Detroit, Sept. 4—Special telegram—The Saxon four has been reduced in price $100, now selling at $395, the former price before the model was enlarged and demountable rims added. The change now is effective. The Saxon company has offered for sale its Spring Wells plant to raise more working capital.



EDITORIAL PERSPECTIVES



Make That Gallon Go Further

WHEN we rode bicycles we knew when the bearings were well oiled and properly adjusted and the tires properly inflated. We knew when everything was right by the less leg power needed. We knew the difference by the less heart power expended. We knew the difference by the less lung power needed. We knew the difference by the less general expenditure of our powers.

THERE was no disputing the fact that a well-oiled and well-adjusted bicycle meant less muscle power to propel it. To have the bicycle running all right it was necessary to have everything right. It was not enough to have the tires right or the bearings right or the steering right or the seat right; all had to be right.

BRING this bicycle lesson up to date: There is a parallel in the motor car. To have the car running right all parts must be adjusted correctly. It will not profit you much if the engine is in fine shape but the differential housing dry so that engine power is eaten up in the back axle. It will not profit you much if your brakes are dragging and a gallon of gasoline, or perhaps more, is being used each day solely because of bad brake adjustment.

IT will not profit you much if the front and rear wheels are not lined properly, so that there is a constant fighting for road space among them. You wear out the tires and cut down the power.

IT will not profit you much if you have your carbureter set up to the last notch for fuel efficiency and the compression in a couple of your cylinders is so poor that your economy is thrown to the four winds.

IT will not profit you much if your carbureter is set up but the spark plug points are not spaced correctly or are dirty and you do not get the correct heat of spark and the gasoline exploded does not give you the power it should.

IT will not profit you much if you have all of your ignition apparatus just up to the minute, distributer points clean, breaker points clean, magnets strong, terminals all tight, if your valves do not seat as they should and the mixture is partly lost and power goes down.

WHAT economy in gasoline will you accomplish if you have all the mechanical parts of the car in A1 condition but your tires are run at under-inflation and are eating up a lot of the power you have been working for by cleaning all other parts up to the 100 per cent point?

IN a word: The efficiency of a car is just about the efficiency of the weakest link. It is like the bicycle: You must have all parts right and then the machine will literally want to run over every other car on the road and it will be doing it efficiently.

HERE is the application: Conserving gasoline is the problem ahead of us. We must do it. The war demands it. Keep on using your car. Use it as much as you ever do. BUT use it more efficiently. Do your bit as an U. S. A. citizen by getting your car in better running condition. If your garageman is too busy, then do the work yourself. If you never did the work before yourself, start now.

YOU owe it as a citizen's duty to every man we send over seas to work harder at home. To do more things than we have done in the past, to be citizens in the fuller sense of the terms. Start to-day being a better motor citizen than you have ever been before.

Farm Tractor Service

A NEW chapter in service rendered by motor car dealers is brought into existence by the farm tractor, which when it goes wrong cannot very well be driven from the farm to the city garage but which in may cases will have to be repaired on the farm. Heretofore the motor car dealers and garagemen have had the cars and trucks brought to their places of business, but now it looks as if they will have to extend their service systems and go to the farm. If Mahomet cannot come to the mountain then the mountain will have to be transported to Mahomet, or something equivalent thereof.

THE more rapid development and use of the farm tractor is being held back to-day through lack of service and through poor service. Tractor makers admit there is no more serious problem they are up against than that of tractor service. They cannot get spares to the farmers quickly enough. They cannot educate the farmer well enough to give proper care to the tractor, to house it as a motor car is housed, to oil it as it should be oiled, to keep the parts adjusted as they should be adjusted, and to know how to run it so that the bearings are not being hammered unduly and so that the tractor will give that service which it is intended that it should give.

THERE is the chance of the motor car dealer, the garageman and the repairman. You all have an opportunity of doing your bit in this service field. If you are not handling a tractor you still can help. It may be that conditions will not merit your starting to-day or even to-morrow, but you owe it to your own business to be examining the present situation and preparing for what is certain to come rather rapidly. The present exigency in tractor service points to some mobilized repair shop mounted on a ton or 2-ton truck that can make circuits through the country and do repair work on tractors right on the farms. Such mobile repair shops are being used in the war zone to-day. When trucks go wrong in the shell zone or immediately back of it these repair trucks, well stocked with parts as well as fitted with drills, lathes, drills, grinders and other small machines, make the early repairs. The same can be done on the farm with the tractor. At first there will be only certain sections of the country where the number of tractors will warrant such. True. But such mobile repair shops will pick up much car repair work. There is an opportunity here not to be passed up until too late.

THE farm tractor is one of the examples of bigger business brought on by the war. We need more farm tractors to make up for the loss of man power on the farm and elsewhere.

Conservation of Man Power

Motor Trucks Eliminate Five Men, a Branch House, Two Teams and Cut the Cost of Transportation

OBSERVATION of a typical freight yard just now convinces one of the reason why many concerns are obliged to revamp their delivery systems. The freight car shortage that comes every year promises to be more severe this fall than ever before and shippers of freight find their resources taxed to move their product by rail with any regularity. Is the motor truck the solution? Evidences, many of them, may be found to support an affirmative answer. In many instances the substitution of motor truck trains conserve man power at the same time they provide more stable delivery service.

"Two motor trucks have eliminated a branch establishment, a branch manager, a bookkeeper, a plant foreman, two horse-drawn wagons and two drivers for a provision company in Cleveland—all at a cost barely equal to previous charges for freight and drayage alone," says System for September. "The motor trucks also are increasing sales through giving more prompt service, as well as cutting costs on business that was formerly handled over the railroads."

About 30 miles west of Cleveland are two thriving centers—Elyria and Lorain. Along the road out from Cleveland are numerous smaller suburban localities not to be overlooked as desirable markets. Originally the provision house maintained a cold storage plant at Lorain, manned by five employes. Supplies for this house were transported by rail each day to Lorain, via Elyria. Under normal schedule the car reached Elyria the day after packing. There it was uncoupled and the Elyria shipments removed so that the second day after packing the car reached Lorain, if all went well. The remaining goods were loaded on wagons and hauled to the branch house for distribution. Orders could not be delivered to the customer's place of business until at least the third day after the car was packed.

This delay was costly in more ways than one. The provision business is highly sensitive to weather and other conditions and it is difficult to forecast demand. Frequently the branch house was overstocked on some lines and on others it was short. Reduced prices often were necessary to move excess stock. Complaints were many because orders were three days on the road. Finally the company decided to employ motor trucks to develop and handle this suburban trade.

The former force at Lorain is reduced to two salesmen, one of whom is stationed at Elyria and the other in Lorain. Each covers his town and way-station during the day and his orders reach the Cleveland plant early each morning. The salesman numbers his orders to facilitate in loading the truck so that the packer can pack the orders to save the driver much time and not require doubling back on his trip.

THIS is the second article of a series which will show how business men are conserving man power; how motor trucks and motor cars increase efficiency, broaden the field of the salesman and of the business house, at the same time relieving much of the almost overwhelming burden now on the shoulders of the railroads. This is a time when the railroads need relief from the impending severe car shortage; this is the time when man power must be conserved. Motor cars and trucks can and are doing more than their bit in this type of work.—Editor.

A 3-ton truck operates daily over the Lorain route, and its monthly mileage average is 1700 miles. The same company operates trucks in other directions from Cleveland and finds that:

1—Trucks operate at a cost no greater than the sum of the freight costs and drayage charges of the earlier system. The previous overhead expense of the branch station, made up of five salaries, rent upkeep, supplies and depreciation, is now a total saving of no inconsiderable size.

2—All goods now reach the customer absolutely fresh, always on the same day they leave the plant. Over half of the orders are delivered the day after they are placed. These two facts are proving wonderful sales arguments, immediately apparent in results.

3—The company is practically free from costly delays, their resultant complaints from customers and claims against the railroad from depreciation—expensive in the time they formerly consumed for the office departments. With truck delivery the whole transaction is personal from the time the salesman takes the order until the truck delivers the goods to the customer's place of business. All the many chances for misunderstandings, mistakes and delays which developed under the old system—where both a railroad company and a drayman handled the goods in transit—now are eliminated.

4—Perhaps the most graphic result of the new policy, however, is the fact that the company's sales charts show that the cost of selling and delivery in the Lorain-Elyria district has been cut in half. All the other advantages, therefore, may be regarded fairly as velvet. Furthermore, there is evidence of doing the same work with much fewer men, to say nothing of the reduction in expense. A man relieved means that he is available for service elsewhere and thus the conservation of man power, which is such a material factor now that so many of our patriots are in the service of our country, gains in force.

DIXIE OVERLAND PLANS MEET

Savannah, Ga., Aug. 31—The Dixie Overland Highway Association is preparing for its fifth annual convention which will be held this year Sept. 5 at Meridian, Miss. Officials of the association in Georgia, Alabama and Mississippi are this year working hard to get the largest possible number of cars to make the tour to the convention. Other officials west of the Mississippi are working just as hard to get cars along the route from the western end of the highway.

Application blanks are being spread thoroughly along the route, that parties who expect to make the trip may sign up and be registered. The highway will be opened formally through Georgia, from Columbus to Savannah, Oct. 14, during the Chattahoochee Valley fair, when a party from Savannah, gathering other tourists as they come, will be the guests of the Columbus enthusiasts.

From Meridian, after the convention Sept. 5, the tourists will go to Vicksburg, and will return home as they please.

TOURAMOBILE IS COMING

Madison, Wis., Sept. 1—It is reported on excellent authority that interests represented by Elwood Haynes, of the Haynes Automobile Co., Kokomo, Ind., and Winthrop Burdick and C. E. Schinberg, Chicago, are negotiating for the establishment of a plant at Madison, Wis., for the manufacture of a touramobile type of passenger car, equipped for quick transformation into a camping outfit. It is said that the Government already has agreed to purchase 500 to 750 of the cars. Further details are not available at this time.

WANTS WOMAN DRIVER

Washington, D. C., Sept. 1—The latest innovation by the Postoffice Department in connection with the further use of motor apparatus has been introduced by Postmaster W. T. Albertson of New Philadelphia, Ohio. Mr. Albertson has inserted in the newspapers an advertisement for a young woman "who can drive an automobile, to deliver parcel post packages. Short hours and good pay."

Postoffice authorities express the view that a wide and interesting field may be found in the postal service for women drivers, now that the necessities of war are taking so many men from different branches of the mail service. Experience by business houses show success with women as drivers.

When the Nation Is at War Every Citizen Is at War

Farmers Study Tractors

More Than 4500 Gather for Demonstration at Marion—More Crops Needed

England Increases Her Food by Supplying Machines

CHICAGO, Sept. 4—Between 4500 and 5000 farmers attended the tractor demonstration at Marion, Ohio, Aug. 23. Motor cars lined up on the roads numbered between 1000 and 1500. The affair was an educational one throughout, and as a result more farmers to-day know more about the tractor than they ever hoped to before the demonstration. Eight makes of tractors were entered, and some of the companies had two machines on the ground so that while one was plowing the other could be taken apart and explained to spectators.

England is helping her farmers by actually supplying tractors. The Cabinet has decided that a large increase must be made in the corn and potato acreage for the 1918 harvest, and the Food Production Department has in charge the work of seeing that this is done. The first object is to insure that all farmers make the fullest use of their resources. However, the department will have to assume responsibility for that which the farmer cannot do alone. The department is obtaining for the country committees tractors and other requisites.

Whether the United States will undertake anything like this is entirely a matter of the future. However, the attendance at Marion, as at previous demonstrations this year, and the increasing number of tractors to be seen on the farms about the country, show that this country is awakening to the need of larger harvests. The demonstration at Marion was of special merit since it showed the farmers what a tractor could do and the operations necessary to get results. Each tractor was required to plow an 8-in. furrow and to run in a straight line. The land to be plowed was measured, staked and assigned to each machine on the basis of the number of plow bottoms pulled, width of plows and spread of machines. An average of an acre an hour was made.

The Standard Oil Co. furnished gasoline and lubricants without charge and sent an expert fuel man to direct the proper use of lubricants. The tractors and companies represented are: Bull Tractor Co., Minneapolis; Moline Universal, Moline Plow Co., Moline; J. I. Case Co., Racine; Huber Mfg. Co., Marion, Ohio; Happy Farmer Tractor Co., Bucyrus, Ohio; International Harvester Co., Chicago; National Tractor & Plow Co., Gary, Ind.; Ohio Mfg. Co., Upper Sandusky, Ohio.

STUDEBAKER SALES INCREASE

South Bend, Ind., Aug. 31—Sales of Studebaker cars have improved steadily of late and the week before last, the latest period for which data is available, reached the highest point for any week since that of May 5, with a total of just under 1000 cars. Sales to date since Jan. 1 are over 31,000 cars compared with about 45,000 for the same period of a year ago. The decline is due to the slump which lasted in its worst degree from the middle of May to the middle of June. Production is being maintained at close to 1000 cars a week, keeping pace with sales.

The six months' period ended June netted a profit of just under $3,000,000, and the second half year, it is expected, should contribute better than $2,000,000. This balance compares with $8,611,245 in 1916.

TURNBULL TO MAKE TRUCKS

Defiance, Ohio, Sept. 4—The Turnbull Motor Truck & Wagon Co. has been organized with a capital of $1,000,000 to make 1½-ton motor trucks. W. O. Allen, general manager of the Allen Motor Co., Fostoria, Ohio, will head the new corporation. No price has been announced, though several of the trucks have been built and used in testing and demonstration. The plant, that in which Turnbull wagons have been manufactured for forty-one years, has a capacity of from 5000 to 10,000 trucks, it is estimated.



German prisoners are shown here operating a tractor in the region of Ribercourt in France, rebuilding the land they so ruthlessly destroyed

Exports Off $7,000,000

Year's Figures Show More Cars but Less Trucks with Corresponding Decrease

Import Prohibitions and Lack of Shipping Felt

NEW YORK, Sept. 1—Exports of motor cars and trucks fell off nearly $7,000,000 during the twelve months ended June 30, 1917. More cars were exported, due to larger shipments to most of the countries outside of Europe, and this increase more than offset the decrease in shipments to Great Britain, France and Russia due to import prohibitions and lack of shipping facilities. But the decrease in total value is due to the falling off in the number of trucks exported, the average value of trucks being higher than the average value of passenger cars exported to countries outside of Europe.

During the last fiscal year, 80,800 cars and trucks, valued at $90,958,243, were shipped, as compared with 77,499 cars and trucks, valued at $97,465,811, during the preceding fiscal year. Exports of commercial vehicles and passenger cars during the two years were:

	1916		1917	
	No.	Value	No.	Value
Trucks	21,265	$56,806,648	15,977	$42,337,315
Cars	56,234	40,660,263	64,334	48,620,928

The most remarkable increases were shown by Mexico and the South American republics. Mexico's commercial recovery is reflected by an increase from $409,700 to $1,833,975 in the year. Argentina's imports reached nearly $2,500,000. Brazil's imports trebled. Chile's prosperity from her nitrate mines resulted in an increase from $576,777 to $1,982,538. The rest of South America took motor cars to the value of $1,804,827, as compared to only $696,911 the year before.

As usual Great Britain and France were the largest buyers. Exports to the rest of Europe increased remarkably when it is remembered that no shipments went to the central empires. The increase amounted to more than $1,000,000 in the year, accounted for largely by exports to the Scandinavian countries, Holland and Spain. Europe as a whole took slightly less than a third by valuation of the total exports. Next in order in buying were Canada, Asia and Oceania, Australia, the West Indies and the British East Indies.

Aside from motor cars and trucks, the United States exported 23,435 motor car engines valued at $2,844,406; tires worth $12,330,201; and parts worth $27,284,932. This makes a grand total of $133,417,782 of foreign motor car business done by the country last year.

DETROIT SHOWS ITS CARS

Detroit, Sept. 1—To-day is motor day at the Michigan state fair, and Detroit dealers have about 100 passenger cars and trucks on exhibition in the motor car building at the fair grounds. The exhibition

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lacks the usual crowd, as there are other attractions that call the curiosity seekers. But a constant stream of people that are actually interested in motor cars is going through the building.

At the rear of the building, a complete Ford service station has been erected, and actual repair work is being done on Ford cars. Here the prospect can see the car enter the shop, be torn down, repaired and assembled. At the other side of the building, in a miniature theater, moving pictures of the Ford car are shown. And just in front of this, all models of the Ford line are on exhibition. From manufacture, performance, construction and repair, the exhibit is complete.

EASTERN MOTORS TO RESUME

New Britain, Sept. 1—An early resumption of business by Eastern Motors, Inc., maker of the Charter Oak six, has been announced by Judge William J. Larkin, Jr., receiver. The company will carry out the original plan to make only the best kind of car. A meeting of the board of directors was held recently, and plans for resuming business were considered.

U. S. SOLID TIRE CONVENTION

Providence, R. I., Sept. 1—The commercial vehicle section of the United States Tire Co. held a convention here last Tuesday, when branch managers and salesmen from all parts of the United States met to discuss the ways and means of selling truck tires. About seventy attended and were taken through the solid tire plant, which is located here. There was a dinner at which C. E. Welch, sales manager of the commercial vehicle tire branch, presided, together with Harlow W. Waite, factory manager of the Providence plant.

REPUBLIC SHOWS MILLION PROFIT

New York, Sept. 1—The annual report of the Republic Motor Truck Co. for the fiscal year ended June 30 shows net profits of $1,384,227 accruing to the new company. Dividends paid on the preferred stock amounted to $85,538, and expenses of preferred stock issues totaled $32,199. After the deduction of these two items and the addition of $247,179 surplus arising from re-appraised of properties, there remained a balance of $1,513,669 available for the 76,325 shares of common of no par value. This balance is equivalent to approximately $20 a share earned on the common stock.

RECEIVER FOR AUTO PARTS

Chicago, Sept. 4—The Auto Parts Co. has been forced into the hands of a receiver by the action of some of the creditors. The receivership was brought about principally by the stockholders who were dissatisfied with the way the company was run under the old management. After a preliminary hearing it was decided it would be advisable to run the company under a receiver's jurisdiction. The business will be conducted the same as in the past, and stock on hand at the present time is sufficient to enable the filling of nearly all orders received. The Auto Parts Co. is one of the pioneer firms in the supply business.

Make These Gas Notes

What N. A. C. C. Suggests to Owners for Saving Fuel for Army

Shortage Due to Lack of Well Equipment

1—Do not use gasoline for washing or cleaning—use kerosene to cut the grease.
2—Do not spill gasoline or let drip when filling—it is dangerous and wasteful.
3—Do not expose gasoline to air—it evaporates rapidly and is dangerous.
4—Do not allow engine to run when car is standing. Cars are fitted with self-starters and it is good for the battery to be used frequently.
5—Have carbureters adjusted to leanest mixture possible—a lean mixture avoids carbon deposits.
6—See that piston rings fit tightly and cylinders hold compression well. Leakage of compression causes loss.
7—Stop all gasoline leakage. Form the habit of shutting off gasoline at the tank or feed pipe.
8—See that all bearings run freely and are well lubricated—friction consumes power and wastes gas.
9—Protect the radiator in cold weather—a cold engine is hard to start and is short in power.
10—Keep the tires fully inflated—soft tires consume power.
11—Do not drive at excessive speed. Power consumption increases at a faster rate than speed. Every car has a definite speed at which it operates with a maximum fuel economy.
12—Change gears rather than climb hills with wide open throttle—it saves car and gas.
13—Do not use cars needlessly or aimlessly. By exercise of forethought a number of errands can be combined so that one trip to town or elsewhere will do as well as two.
14—Reduce the amount of riding for mere pleasure by shortening such trips or cutting down their frequency.

CHICAGO, Sept. 1—The accompanying suggestions for economy in the use of gasoline are those which the National Automobile Chamber of Commerce is preparing for display in service stations, garages and supply stations throughout the country. The campaign which they mark is one undertaken to guarantee ample fuel for Army and Navy, though not necessarily one entailing curtailment of motoring in general. It is estimated that the Army will need 350,000,000 gal. of gasoline for airplanes, trucks, tractors and so on. Car owners will not be forced or even advised to lay up cars, but they will be urged to use their cars thoughtfully and judiciously.

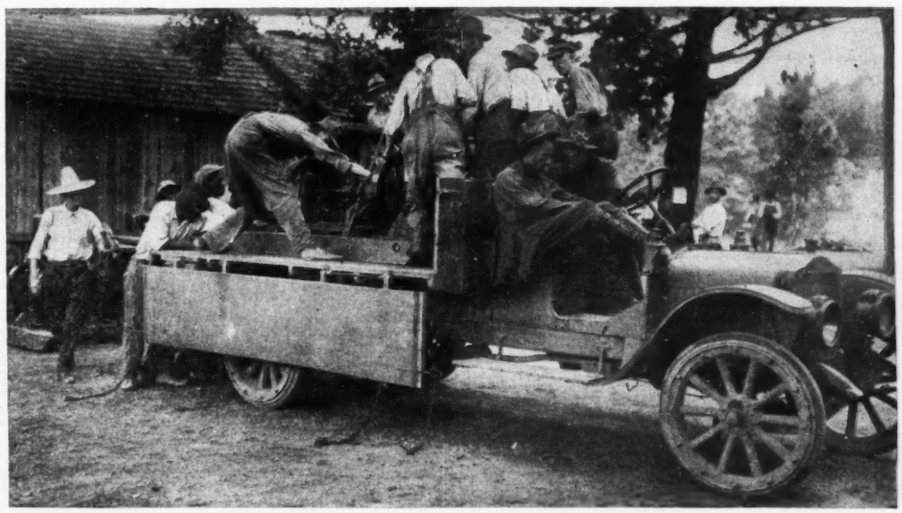
If car owners are economical in this respect, according to Director Van H. Manning of the Bureau of Mines, there will be no undue scarcity, for the United States possesses an abundant supply for ordinary purposes.

The situation here differs from that in England, because England is entirely dependent on imports for her gasoline, whereas the United States is a large producing country. Of the 2,500,000,000 gal. of gasoline refined in this country last year about half was used by the 3,500,000 motor vehicles. Even if only 10 per cent is saved by motorists, this will amount to more than 125,000,000 gal. in a year.

Every effort is being made to tap resources of supply, and government restriction on the use of oil is not yet being considered. The shortage is said to be due to two causes, first, the great demands being made on all lines of manufacture and the inability to get materials needed; second, the delay in transportation of supplies. Small producing wells are being abandoned so that the equipment may be used for new wells from which large production is expected, there being not enough equipment for both new and old. It is stated that the government, if necessary, could open large areas in the West which were closed to development in 1910, but here again the difficulty in obtaining equipment would be a factor. The shortage of supplies of this nature has been taken up with the Council of National Defense by Mr. Manning.

PARIS BUYS PIERCE-ARROWS

Paris, Aug. 15—An order for 100 Fiat 3½-ton trucks and 100 Pierce-Arrow 5-ton trucks has been placed by Paris. The total expenditure is $2,260,000. The price of the Pierce-Arrow trucks is $9,600 each, and the



Motor trucks are used to deliver machinery at Camp Greene, Charlotte, N. C., where some of the troops, those of New England, will train

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Fiats $6,800 each. In addition $620,000 are being spent on spare parts.

The municipal trucks are to be used for the distribution of coal, flour and general food stuffs in Paris and surrounding districts during the coming winter. Last year the city had a stock of 200,000 tons of coal which it had to distribute to local committees and small dealers, but having no trucks, it had to appeal to the army for assistance. During the coming winter the coal stock will be at least 500,000 tons for Paris and 800,000 tons for the surrounding district. In addition, large quantities of potatoes and flour have to be distributed. The city will have the trucks entirely under its own control, and not in the hands of an intermediary.

Originally it was hoped to get French trucks, but on formal application being made to the war department to allow the French factories to deliver, a refusal was met with. The war department offered to sell to Paris 200 American trucks for which it had no use, at a cost of $4,000 each. The technical committee considered the price too high.

Railroad facilities being insufficient between Lyons and Paris, the Chamber of Commerce of Lyons has decided to run a regular motor truck service between the two places. The round trip is nearly 600 miles, making this the longest route for a regular truck service.

GREECE OFFERS OPPORTUNITY

Greece is expected to be a new field for American cars after the war. Many shipowners have become wealthy through successful operations in the Balkan and present wars. They desire cars and in some cases advertise their willingness to pay the high prices demanded for cars and for gasoline. During the last year gasoline frequently has sold at $2, $2.50 and $3 a gallon. The lightness of the average American car also would make it suitable for the rough roads of Greece.

After Italy entered the war, exports of cars from Germany and Austria were shut off automatically. And as the Allied nations needed the entire output of factories for war purposes, the American market would have had a fair monopoly of the Greek trade but for restrictions placed by the allies on imports of motor cars into Greece to Austria and Bulgaria.

In 1912 Greece imported $51,151 worth of cars; in 1913, $62,907; in 1914, $106,652; in 1915, $79,482. Truck imports in 1915 amounted to $2,895. Figures for 1916 are available only for the first nine months, and even for this period are thought to be incomplete. According to these figures the imports from January to September, 1916, amounted to $126,605, and the imports of spare parts were $6,295.

WIRING GUIDE $7.50

The official motor car wiring guide, which contains diagrams for 463 different car models and which was described in MOTOR AGE for Aug. 23, sells for $7.50 and not $11.50 as noted then. It is published by International Motor Institute, Chicago.

Accessory Men Indicted

Sixteen Makers and N.A.A.A.J. Commissioner Accused of Violating Sherman Law

Organization's Work With Federal Trade Body Cited

CHICAGO, Sept. 1—Indictment of sixteen manufacturers of motor car accessories, together with William M. Webster of Chicago, commissioner of the National Association of Automobile Accessory Jobbers, and nearly a score of other individuals, charging conspiracy to restrain trade in violation of the Sherman Law, is causing little apprehension on the part of members of the association, according to Mr. Webster.

The Federal grand jury in New York returned an indictment Wednesday charging that the association was formed to fix prices and that jobbers were required to sell goods which were sold to them at 40 per cent below list price, at or above list price, or be penalized by forfeiting their membership in the association.

Mr. Webster points out that the association has been working with the Federal Trade Commission and declares there is an apparent lack of understanding between the Federal Trade Commission and all branches of the Department of Justice. He makes a strong denial of the price-fixing charge and says that the association is within its rights in all its work, and bases his contention on the advice of attorneys.

Digest of Indictment

The indictment, returned by a grand jury of the United States District Court for the southern district of New York, charges that the association was practically organized, and has been operating to monopolize the motor car accessory business of the country. The indictment, a thirteen-page document, recites practically every resolution passed by the association which might be construed as tending toward control or reduction of the accessory business. It cites that "each and all of the corporate defendants unlawfully did knowingly and wilfully engage in a conspiracy to monopolize the aforesaid trade and commerce in automobile accessories contrary to the act of Congress approved July 2, 1890, entitled 'An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies and Act Amendatory Thereof and Supplemental Thereto.'"

The indictment cites the meeting of the jobbers to form the association, its agreeing to and adopting a constitution and by-laws and practically all resolutions adopted. Some of the resolutions extracted from the proceedings of the association refer to subjects as follows: Maintenance of resale prices; publishing of lists of alleged jobbers; opposing the distribution of accessories through purchasing agents or syndicates; not favoring the sale of accessories to mail order houses and motor leagues; not favoring syndicate catalogs; and many other subjects.

The indictment, referring to the list of jobbers as published by the association, charges "promulgating throughout the accessory trade a list of eligible or legitimate jobbers which was intended and understood to blacklist all jobbers whose names did not appear thereon and which was intended to prevent said jobbers from purchasing said accessories at jobbers' prices, and was also intended to prevent manufacturers who were associate members of the association and whose names appeared on the list from extending jobbers' prices on goods manufactured by them to said jobbers."

The indictment further charges the association with "inducing, intimidating, coercing and compelling manufacturers and jobbers, members of, or recognized by, the association as legitimate manufacturers and jobbers, by the issuance of association bulletins and correspondence sent throughout the United States to them and also by investigation of complaints at association meetings to observe, obey and live up to the policy of the association."

This indictment is only preliminary. The matter must next come to trial. If in the trial any of the members are proved guilty they may have to pay a fine of $5,000 and serve a year in the Federal prison. It probably will be a long time before the matter is settled. What the indictment really means will not be known until the trial is ended.

Among individuals and corporations named in the Federal indictment are: Willard W. Low, Thomas M. Brooks, Sidney F. Beech, Electric Appliance Co., Automobile Supply Co., and the Motor Car Supply Co.; J. Stanley Clemence, Portland, Ore.; George E. Edmunds, Detroit, Mich.; Sidney B. Dean, St. Paul, Minn.; Edward C. Graham, Washington, D. C.; F. Hallett Lovell, Jr., Newark, N. J.; Richard H. Englehart, Davenport, Iowa; William K. Norris, St. Louis; Harry R. Williams, Indianapolis; Fordyce B. Caswell, Toledo, Ohio; Charles E. Faeth, Kansas City, Mo.; Grant F. Discher, Milwaukee; William L. Ferrier, St. Louis; Henry P. Andrae, Milwaukee; William Sparks, Jackson, Mich.; Emil Grossman, Brooklyn, and Arthur M. Moody, Boston. Among the concerns named are the Fred Campbell Auto Supply Co., St. Louis; Ballou & Wright, Portland, Ore.; Edmunds & Jones Corp., Detroit; Nichols, Dean & Gregg, Inc., St. Paul; Wieg Company, Davenport, Iowa; McQuay-Norris Mfg. Co., St. Louis; Gibson Co., Indianapolis; Champion Spark Plug Co., Toledo, Ohio; Motor & Machinists Supply Co., Kansas City, Mo.; Gemco Mfg. Co., Milwaukee; Julius Andrae & Sons Co., Milwaukee; Sparks-Withington Co., Jackson, Mich.; Emil Grossman Mfg. Co., Brooklyn, N. Y., and Wetmore-Savage Co., Boston.

$6,000,000 IN SIX MONTHS

New York, Sept. 1—The Willys-Overland Co. in the first six months showed earnings of $6,000,000, which, after allowing for proportionate dividend requirements on the $15,000,000 preferred stock, is equal to 14.72 per cent on the $37,273,844 common stock outstanding, or $3.68 a share, $25 par value. The output in the first half year period amounted to 91,489 cars, compared with 94,477 in the same period of 1916.

Earnings of $6,000,000 for the six months ended June 30 compare as follows with those for the calendar years 1915 and 1916, and with the half year ended Dec. 31, 1914, which was the time of the change of the fiscal period of the company from the June 30 year to the calendar year: 1916, $10,016,420; 1915, $10,870,678; 1914, $3,169,099.

A CORRECTION

In the April 19 issue of MOTOR AGE there appeared a brief news item specifying that the Corcoran-Victor Co., Cincinnati, Ohio, had been given an order by the Ford Motor Co. for 5,000,000 lamps. This was a typographical error and should have read 500,000.

A. B. C. of Aviation

Nomenclature of Aeronautics as approved by the National Advisory Committee for Aeronautics Concluded

TAIL—The rear portion of an aircraft, to which usually are attached rudders, elevators and fins.

Tail fins—The vertical and horizontal surfaces attached to the tail, used for stabilizing.

Thrust deduction—Due to the influence of the propellers, there is a reduction of pressure under the stern of the vessel which appreciably reduces the total propulsive effect of the propeller. This reduction is termed thrust deduction.

Tractor—See Airplane.

Trailing edge—The rearmost portion of an aerofoil.

Triplane—A form of airplane whose main supporting surfaces are divided into three parts, superposed.

Truss—The framing by which the wing loads are transmitted to the body; comprises struts, stays and spars.

Velometer—See Air-speed meter and anemometer.

Vol-piqué—See Nose dive.

Vol-plane—See Glide.

Wake gain—Due to the influence of skin friction, eddying, etc., a vessel in moving forward produces a certain forward movement of the fluid surrounding it. The effect of this is to reduce the effective resistance of the hull, and this effect, due to the forward movement of the wake, is termed the wake gain.

In addition to this effect the forward movement of this body of fluid reduces the actual advance of the propeller through the surrounding medium, thereby reducing the propeller horsepower.

Warp—To change the form of the wing by twisting it, usually by changing the inclination of the rear spar relative to the front spar.

Wings—The main supporting surfaces of an airplane.

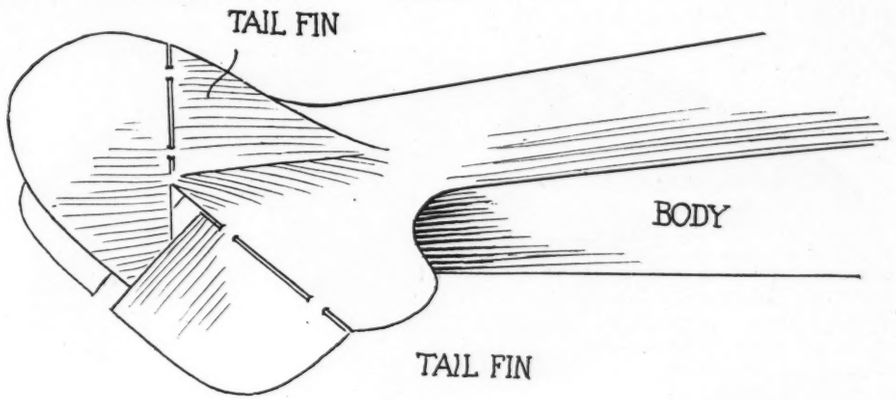
Wing loading—The weight carried per unit area of supporting surface.

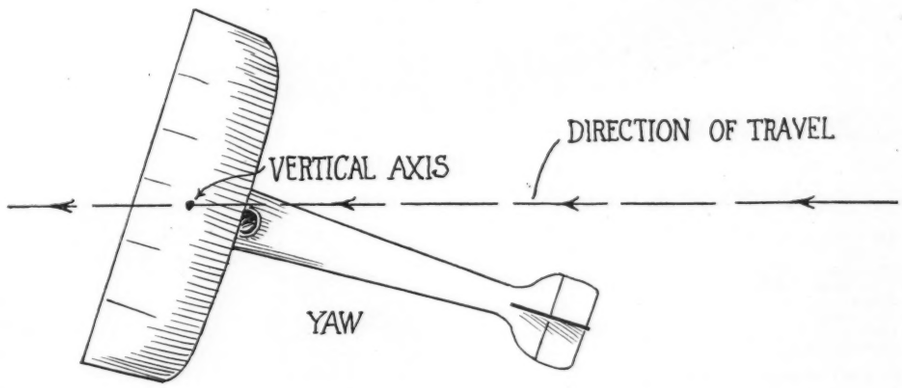
Wing rib—A fore and aft member of the wing structure used to support the covering and to give the wing section its form.

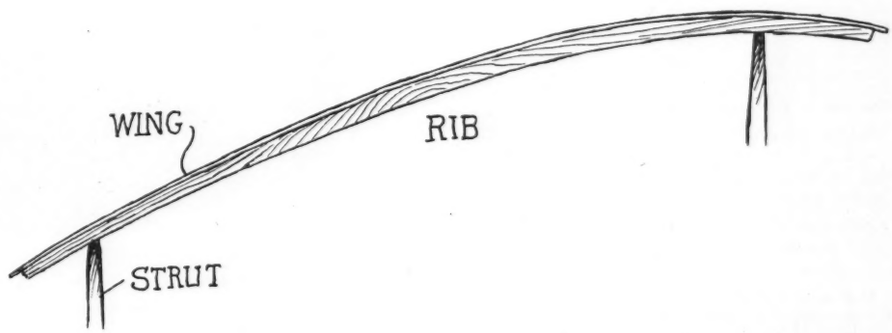
Wing spar—An athwartship member of the wing structure resisting tension and compression.

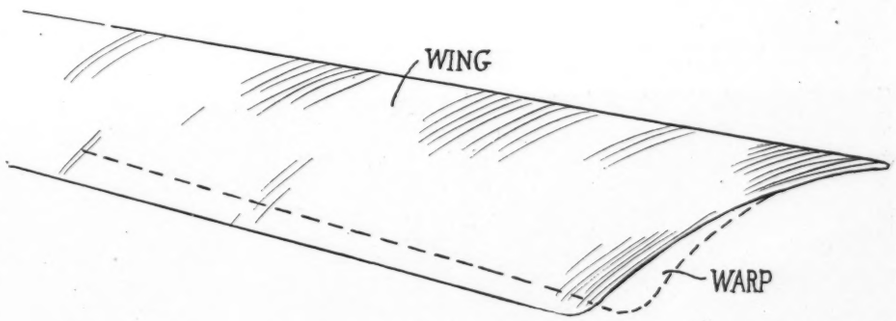
Yaw—To swing off the course about the vertical axis, owing to gusts or lack of directional stability.

Angle of—The temporary angular deviation of the fore and aft axis from the course.









LARGE MICA DEPOSITS FOUND

Van Horn, Tex., Sept. 1—Mica is used in the motor trade to such an extent that the development of what is said to be one of the largest deposits of this mineral in the world, near here, is of unusual importance. The deposit is of about 1260 acres. It is estimated the deposit contains more than 150,000,000 tons. The mineral is used for a variety of purposes. It is used in sheets and as washers and disks in dynamo-electric machinery, electric light sockets, spark plugs, insulators, guards in rheostats, fuse boxes and in countless other ways.

FIRE BURNS THIRTY SAXONS

Detroit, Aug. 31—For the second time in seven months the Saxon Motor Car Corp. has suffered damages by fire. A fire last night destroyed thirty motor cars belonging to the company. They were loaded at the Michigan Central loading dock.

De Palma and Chevrolet Share Honors

Ralph Wins 20- and 50-Mile—New Marks for Chicago—Frenchman Wins Century

By William K. Gibbs



De Palma, winner of most points, grins with reason

CHICAGO Speedway, Sept. 3—Ralph de Palma shook his jinx and shared honors with Louis Chevrolet this afternoon in races which set two new world's records and threw into the scrap heap every mark previously made on the local track for the distances covered. De Palma chalked up two wins, his first on the Chicago oval, and captured the Fort Dearborn cup on points. By taking two firsts and one third de Palma won the major portion of the prize money. Louis Chevrolet took second money, Dave Lewis third and Henderson fourth.

Originally it was planned to make the event one race of three heats—20, 50 and 100 miles—but at the last minute it was decided to make each heat a separate race. Forty per cent of the gate was the drivers' share—55 per cent to be put on the 100-mile, 30 per cent on the 50 and 15 per cent on the 20. The winner got 35 per cent of the amount alloted to each event, while the other percentages in the order given were: 20, 15, 10, 8, 7 and 5. Where there were fewer finishers than seven, money for the

POINTS WON BY DRIVERS

	20-mile	50-mile	100-mile	Total
De Palma	35	90	75	200
Lewis	15	50	100	165
Chevrolet (L.)	..	..	175	175
Chevrolet (G)	20	40	...	60
Alley	10	20	40	70
Henderson	8	25	50	83
Mason	7	..	...	7
Trekus	5	..	35	40

TIMES IN 20-MILE EVENT

Driver	10 Miles	20 Miles	M.P.H.
De Palma	5:33.63	11:02.07	108.7
G. Chevrolet	5:34.10	11:02.40	108.6
Lewis	5:39.50	11:17.12	106.3
Alley	5:43.97	11:30.65	104.2
Henderson	5:54.00	11:50.23	101.3
Mason	6:25.05	12:38.39	94.9
Trekus	8:25.05	15:05.58	79.4

TIMES EVERY TEN LAPS IN 50-MILE EVENT

Driver	20 Miles	40 Miles	50 Miles	M.P.H.
De Palma	11:25.58	22:35.63	28:09.38	106.5
Lewis	11:28.05	22:44.16	28:24.65	105.5
G. Chevrolet	12:29.70	23:43.06	29:16.01	102.5
Henderson	11:58.83	23:52.84	29:41.22	101.0
Alley	11:28.68	22:47.85	30:02.68	99.8



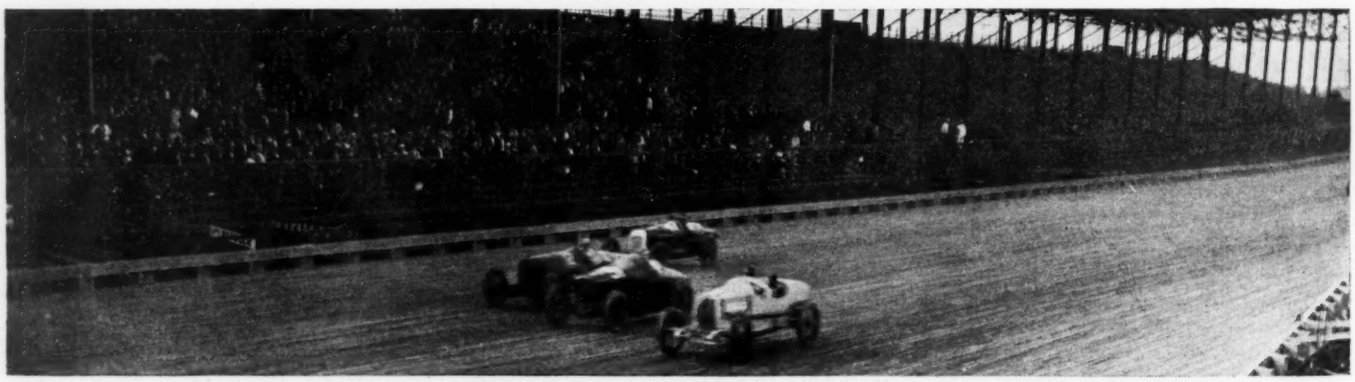
Louis Chevrolet won the 100-mile with Gaston as mechanic

TIMES EVERY TEN LAPS IN 100-MILE EVENT

Car and Driver	20 Miles	40 Miles	60 Miles	80 Miles	100 Miles	M.P.H.
Frontenac, Chevrolet (L.)	11:37.93	22:59.75	34:14.10	45:27.80	56:29.50	106.2
Hoskins, Lewis	11:39.20	23:01.26	34:19.30	45:33.45	56:55.81	105.1
Packard, De Palma	11:37.34	22:59.80	34:14.61	46:26.20	57:36.16	104.1
Duesenberg, Henderson	11:38.33	23:04.57	36:07.66	47:51.46	59:43.72	100.4
Pan-American, Alley*	11:40.12	49:46.20	1:04:15.21	1:16:05.72	1:30:35.37	66.2
Olsen, Trekus	15:29.63	33:58.60	56:14.02	1:18:12.75	1:34:07.37	63.7

L. Chevrolet's time for last lap of 100-mile event, 1:05.20. Average 110.4

*Alley out 28 minutes.



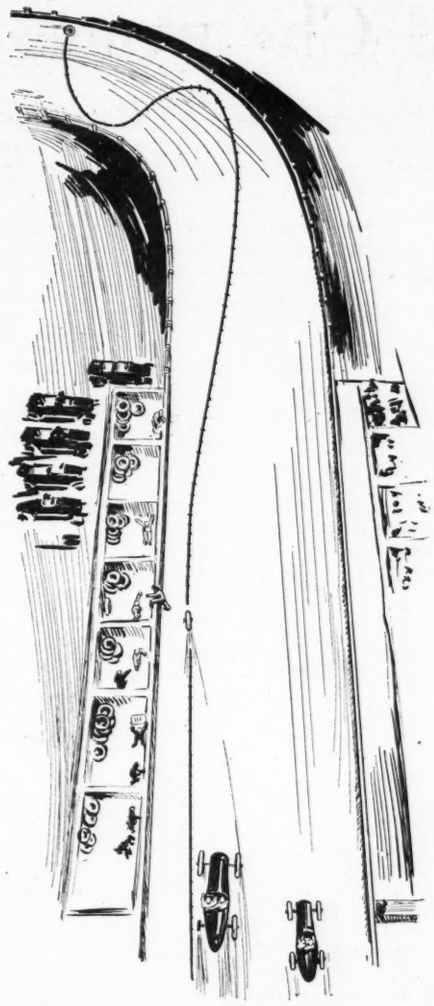
Picture taken when De Palma, Gaston Chevrolet, Lewis and Alley were bunched in the 20-mile

remaining places was pro-rated among those finishing. Each car starting got $100 in case it did not share in the prize money.

In the first race of 20 miles eight cars started. De Palma's Packard had the pole and the others lined up in the order named: Louis Chevrolet, Frontenac; Gaston Chevrolet, Frontenac; Lewis, Hoskins; Alley, Pan-American; Henderson, Duesenberg; Trekus, Olsen; Mason, Ogren. Louis Chevrolet jumped into the lead in the first lap, held it through the second and in a spurt between him and de Palma in front of the stands near the end of the third a connecting rod in the Frontenac let go, smashed through the crankcase and with a display of pyrotechnics Louis was out of the race. Brother Gaston stepped in and gave Ralph a hard battle, however, but de Palma kept in advance of the field and finished in 11:02.4, an average of 108.7, thirty-four hundredths of a second ahead of Gaston Chevrolet, who finished at the rate of 108.6 m.p.h. In this de Palma clipped thirteen seconds from the previous world's record held by Johnny Aitken. This was not quite so fast as de Palma's time made in August at Sheepshead, but that time has not been officially accepted as a record. The Sheepshead time for de Palma was 10:53.8. Alley finished fourth, Henderson fifth, Mason sixth and Trekus seventh. This was the only event of the day in which as many cars finished as there were prize divisions.

The Fifty-Mile

In the fifty-mile event de Palma led at the end of every lap except the second when Dave Lewis crowded across the tape a few feet in advance of de Palma. Gaston Chevrolet was a contender with de Palma for the lead until the former went to the pits at the end of the fifth lap for a right rear and after that until the fortieth mile de Palma, Lewis and Alley ran one-two-three. Alley went to the pits for a tire at the end of 40 miles and both Chevrolet and Henderson passed him so that the finish was in this order: De Palma, Lewis, Chevrolet, Henderson and Alley. Only five cars finished. Those to start were the same as in the 20-mile, except Louis Chevrolet. The Ogren went out with ignition trouble and the Olsen withdrew for a while to repair a broken tie rod. It got into the race again to test its repairs but was flagged off at the end of twelve laps. De Palma's time for the 50 miles was 28:09.38, an average of 106.5 m.p.h. This



Alley's temperamental tire thought it could make better time than the car

was 3 min. 48 sec. faster than Resta's record for the Chicago oval, set in June, 1916.

With the exception of Louis Chevrolet's Frontenac and Mason's Ogren, the starters in the 100-mile event were the same as in the first 20-mile race. Louis Chevrolet took Gaston's Frontenac and jumped into the lead in the first lap. He held it through the second when de Palma took the lead, only to be displaced at the end of the fifth lap, but only for a moment. He got his Packard out front at the end of six laps and kept it there until the end of the twenty-third lap, or 46 miles, when the Frontenac wrested the lead away, Ralph running second for the next 20 miles, or until he came into the pits for a right front tire. The tire was not flat, but Ralph evidently thought it would not hold out. Here Lewis jumped into second and held that position to the end, Chevrolet winning in 56:29.5, or 106.2 m.p.h., a new speedway record for the distance.

Tom Alley's Pan-American furnished the thrill of the afternoon when it cast a left rear wheel just before reaching the wire at the end of 30 miles. The wheel pirouetted toward the pits and there was a wild scramble of pitmen and officials. Near the middle of the pits it veered out on to the track again and zig-zagged into the first turn, went up to the top of the banked track and stopped, a good half mile from where it left the Pan-American to slide perilously into the pits. Alley was supposed to be out but he fitted a new wheel and got back in the race 28 minutes later, beating out the slow-running Olsen for fifth place by a lap. Alley made up ten laps on the Olsen in thirty-five.

A Battle Royal

The early part of the race was a battle royal between de Palma and Chevrolet, the Frenchman often leading in the backstretch and the Italian at the tape. At 20 miles all except the Olsen were bunched, there being not over 100 yards between first and fifth.

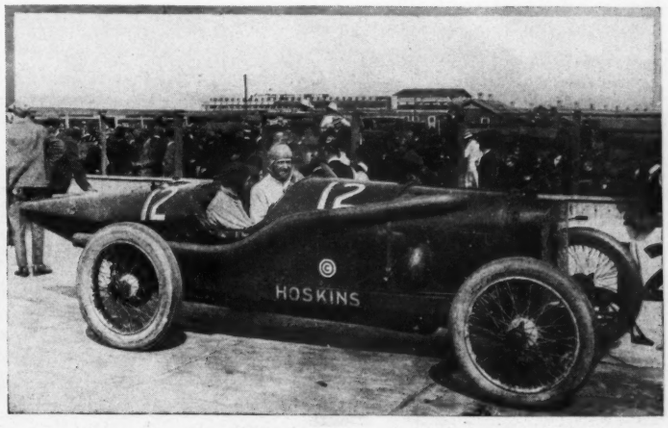
De Palma made his tire change in 19.6 seconds, but could not catch Chevrolet, although he seemed to have the speed to pass Chevrolet. This was demonstrated when Chevrolet was in his last lap, leading Ralph by a little over a lap. De Palma forged ahead of Chevrolet in front of the stands, notwithstanding that Chevrolet's average for the final lap was almost 111 m.p.h., his time being 1 min., 5.2 sec.

The total gate at the Chicago races was $11,051. Drivers split $4,420.40 as follows: De Palma, $1,134.82; Louis Chevrolet, $983.48; Gaston Chevrolet, $355.41; Lewis, $907.06; Henderson, $456.84; Alley, $389.35; Trekus, $211.86; Mason, $46.41.

All except de Palma used Bosch magnetos and Miller carbureters. De Palma had Delco ignition and Zenith carbureter. Spark plugs used were: de Palma, Bethlehem; Henderson, A-C; the Chevrolets, K. L. G.; Alley, Bosch.



Alley in his Pan-American was fifth in the 100-mile despite 28 min. lost



Lewis in the Hoskins Special was second twice and third in the 20-mile event

More Airplane Power to U. S.

Tests of Nation's Aviation Engine Prove Satisfactory—New Moves in Industry

CHICAGO, Sept. 4—That the aviation campaign of the United States government is yet in its infancy and that the sum already appropriated by Congress for aviation purposes, vast as it is and reaching $640,000,000, is to be more than duplicated whenever the proper authorities say the word, is vouched for by those in a position to know. The next aviation appropriation will total a round billion dollars, and even this fabulous sum will not be all, should more be necessary.

By such appropriations as these for a branch of war activity new to the United States will the people of the United States give answer to the suggestion of the Kaiser that this country is not in earnest. Additional appropriations for aviation purposes are not yet necessary, as that already provided is ample to meet present needs as well as those of the immediate future. The Secretary of war, however, and his assistants have been given to understand there will be no hanging back should more money be needed to provide fighting aircraft.

In the meanwhile the numerous tests made with the U. S. A. aviation engines have proved equal to all that was asked, it is understood, and those who have worked with them for several months have not been disappointed in their speed, durability and reliability. The three types of machines being built, the small speedsters for air duels and to be used to screen observation and bombing craft; the daylight bombing machines, designed to offset the danger of anti-aircraft guns and large enough to carry observers, radio and bombs, and the machines capable of great carrying capacity, and to be used at night for bombing purposes, will meet all expectations, it is asserted here.

Specifications for airplane parts, prepared under the direction of Karl W. Simmerschied, are about complete.

Industry Is Active

The industry continues in step with the government's activities.

Henry M. Leland and Wilfred C. Leland, who resigned as president and general manager of the Cadillac Motor Car Co., have completed the organization of a $1,500,000 airplane company. The concern has been incorporated as the Lincoln Motor Co. and has a factory composed of buildings formerly occupied by the Rands Mfg. Co. Now 100 men are at work, and 2000 will be employed soon. An output of twenty airplane engines a day is assured soon. Immediate associates in the company are H. M. Leland, W. C. Leland, W. H. Murphy, Joseph Boyer, John Trix, George H. Laying, W. R. Johnson, William T. Nash, Frank Johnson, A. U. Widman, Ernest E. Sweet, Le Roi J. Williams, E. T. Randall, J. Wilbur Brown and M. W. H. Wilson. The company will manufacture U. S. A. engines.

Orders for $25,000,000 worth of airplane parts for the United States and its allies, including bolts, nuts, turnbuckles and so forth, have been given to the Willys-Overland, Inc., on a twenty-eight week contract. Under contract terms, half the capacity of the Curtiss plants will be devoted to airplane requirements of the allies, the agreement applying regardless of the capacity the Curtiss company finally will attain. The Curtiss company will complete a 200 biplane order for Great Britain within two weeks. This order amounts to $6,000,000.

Articles of incorporation will be filed at Columbus, Ohio, by the Glenn L. Martin Co. soon as the next step toward establishing an airplane factory in Cleveland. The directorate of the new company includes William G. Mather, C. W. Bingham, Alva Bradley, S. Livingston Mather, Charles E. Thompson G. N. Osborne and Glenn L. Martin. Mr. Thompson, president of the Steel Products Co., will be the president of the new company. Mr. Martin will be the vice-president and general manager. The first phase of the business will be assembling, and finished planes will be turned out on this plan. The intention is to manufacture at a later date.

Major R. Perfetti of the royal Italian flying corps, head of the Italian aeronautic mission in the United States, told a gathering at Newport, R. I., recently that airplanes could be flown across the Atlantic to destroy the German U-boat bases if the money for their construction were available. The plan is to build larger airplanes than the latest Italian air cruisers, which can carry twenty-five passengers. This, it is said, would solve the problem of sending airplanes to the allies, and as it is less than 500 miles from Great Britain to Kiel, Wilhelmshaven, Heligoland, Essen and other German U-boat and military bases, these air cruisers could be sent to destroy the German base.

Air Routes and Travel in Detail

IF soon after the war you find it possible to make the Twentieth Century's 20-hr. run between New York and Chicago look like the snail's pace, do not be surprised, for you are being "told you so" now time and again. Already Germany is talking of the new Berlin-to-Begdad air route and of complete commercial air service from Hamburg to as far south as Germany can go after the war. A series of proposals made to the public by Lord Montague, the former chairman of the air board and an authority on all matters pertaining to aeronautics, in substance suggests a British route rival to that planned in Germany.

These suggestions of Lord Montague already have been outlined in MOTOR AGE, but since then more detail has been made available. His suggestions differ from the German scheme in various particulars. In the first place the German scheme still concentrates on Zeppelins. The Central European International Aerial Traffic Co., for which a charter is asked, proposes to establish air lines for transport of passengers, mail and freight, covering the German empire and its allies and leading gradually to fresh commercial relations with neutrals and even enemies in the south of Europe and in Asia. Montague's plan is opposed to this plan—the Grand Circle, embracing Alsace-Lorraine, the German north coast, Poland, Galicia, Trieste, Zurich, Innsbruck—three main routes to Vienna, one each from Hamburg, Berlin and Strasburg; three cross routes and five side routes, all with Berlin as a center. Montague's plan is concerned with Europe and Asia and assumes the use of planes. The main trunk line is from London to Peshawar in India.

Law suits already have established the landholder's proprietary right to the air above his property. Montague proposes to establish a limit by law—2000 ft. or almost half a mile. The level above that he reserves for commercial vehicles, which are to fly with silent engines and at a speed no greater than 80 m.p.h.

Above 10,000 ft. Montague would naturalize the air. Here would speed the fastest airplanes, carrying special delivery letters, government dispatches and all goods, passengers and messages which require immediate delivery.

By Montague's plans for a certain distance above the land there would be no planes, except perhaps the private planes of landowners. Then would come the heavy freighters and above all the fast planes, with traffic officers on the alert to catch license dodgers, speed violators and other transgressors of air laws, which would be inevitable with an organized air traffic.

Police planes, mounted with machine guns, would have the right to fly at all levels and would be able to swoop down on an offender at any level. In place of local constables, aerial police would take the registered numbers of planes breaking the speed limit and might sweep alongside an errant plane with a request to report to the police station next morning.

Many details have been worked out already. The zones would be 5 miles wide; port and starboard indicated by floating signals and lights; landing stages arranged and customs duties on air-borne traffic levied. The Geneva conferences which have made international mails possible will be the model for the conference which will have to be called to get aerial traffic in action. So wide is the prospect that a system of transfer privileges with the German Zeppelin lines is forseen even.

How the 4,242,139 Cars are Divided

New York Leads Nation with 345,936—Now a Vehicle for Each Twenty-Four People

IN the six months ended June 30, 1917, 700,401 motor vehicles were added to the 3,541,738 registered at the end of 1916. This figure is all the more remarkable when one takes into consideration the entry of the United States into the world war.

Compared with the registration figures for the first six months of 1916, the increase this year is 191,724 greater than for the first six months of last year, when the gain was 508,677. This fact is all the more significant showing as it does that in spite of changes wrought by the war situation, and the consequent reduction in production schedules by manufacturers, has not slowed up the motor vehicle business as many predicted it would.

Using the latest figures of the U. S. Census Bureau, the present registration of motor vehicles, shows that there is a motor car or truck in service for every twenty-four persons in the United States, compared with one to twenty-nine at the beginning of this year.

Another interesting point shown is that one-third of the states have registered three-fourths of the total motor vehicles in the United States. Seventy-five per cent of all the motor vehicles in this country are registered in the territory embraced between the Rocky Mountain states and Cape Cod, and north of the Ohio river with the exception of one state, California, which stands by itself. Figuring the number of cars per mile of road in the sixteen leading states, Massachusetts ranks first with 7.1, New Jersey second with 6.8, California and New York, tied with 4, Ohio next with 3.4 and Illinois with 3 for the mile. Thus if registered motor vehicles were equally distributed in their respective states on country roads every mile of highway in Massachusetts would have more than seven cars, New Jersey nearly seven, California four, and New York four, while Ohio would have three and four-tenths and Illinois three.

The state of Iowa leads in the ratio of cars to the population, there being one vehicle for every nine persons in the state. Nebraska is second with one car for every ten, California third with one for every twelve, while New York, which has the most vehicles registered of any state, has one for each thirty persons.

It must be borne in mind that the registration statistics cover all vehicles, including not only passenger cars but motor trucks, taxicabs, and buses as well. The bulk of the registration is composed of passenger cars, but it is estimated that commercial vehicles total approximately 500,000 for the entire country.

There are seven states with registrations of 200,000 or over, and eight states with registrations between 100,000 and 200,000. New York leads in registration, Ohio is second, Illinois third, Pennsylvania fourth and California fifth. Nevada is at the bottom of the list with 6,615 motor vehicles. Iowa shows the greatest individual gain, in number 70,393, and in percentage 41. Twenty-two states showed a gain for the six months of 10,000 or over.

Statistics by Years

Year	Registration	Production	Value, Output
1911	677,000	210,000	$262,500,000
1912	2,010,483	378,000	378,000,000
1913	1,253,875	483,000	425,000,000
1914	1,736,790	573,114	465,042,474
1915	2,471,595	892,618	691,778,950
1916	3,541,738	1,617,708	1,274,625,864
1917, to July 1	4,242,139	*800,000	*650,000,000

*Estimated.

Statistics on Sixteen Leading States

State	No. Cars	Road Mileage	Cars per Mile	Pop. per Car
New York	345,936	79,398	4.0	30
Ohio	297,239	86,354	3.4	18
Illinois	285,000	95,647	3.0	22
Pennsylvania	254,735	91,555	2.7	34
California	247,168	61,039	4.0	12
Iowa	243,184	104,074	2.3	9
Texas	200,000	128,960	1.5	23
Michigan	189,000	74,190	2.5	16
Minnesota	168,000	93,517	1.7	14
Indiana	166,766	73,347	2.3	17
Wisconsin	142,080	75,707	1.9	17
Kansas	139,956	111,052	1.2	13
Massachusetts	133,119	18,681	7.1	28
Nebraska	128,142	80,272	1.6	10
Missouri	125,012	96,041	1.3	27
New Jersey	95,315	14,817	6.8	30
Totals	3,260,652	1,284,651	29	20
Other States	981,487	1,161,109	1.0	28

CHALMERS MEN TO FIGHT

Detroit, Sept. 3—Twenty-two individuals connected with the Chalmers Motor Co. organization have joined the Army or Navy. Included are Lieut. R. I. Bland, formerly assistant manager of the dealer department; Lieut. H. T. Spence, formerly in the engineering laboratory and Lieut. E. W. Huson, formerly assistant manager of specifications and shipments. Five employes of the transmission, engineering, tool and planning departments have gone to France to study aviation near the fighting front.

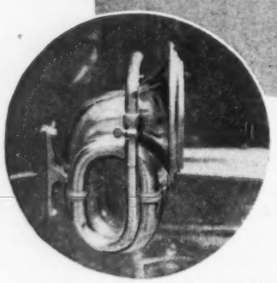
Cars and Trucks in United States, July 1, 1917

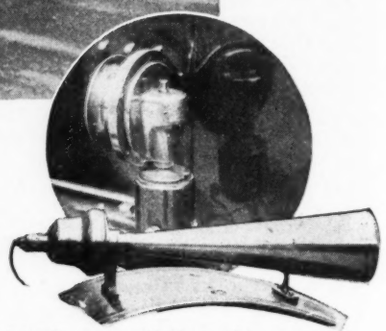
ALL DUPLICATE REGISTRATIONS DEDUCTED

New York	345,936	Washington	68,282	Rhode Island	26,000
Ohio	297,239	Connecticut	63,345	Louisiana	25,406
Illinois	285,000	Georgia	58,010	West Virginia	25,803
Pennsylvania	254,735	South Dakota	55,000	Arkansas	24,200
California	247,168	North Dakota	54,466	Idaho	17,900
Iowa	243,184	Colorado	54,280	New Hampshire	17,702
Texas	200,000	Maryland	47,854	Utah	17,065
Michigan	189,000	Virginia	44,550	Arizona	16,750
Minnesota	168,000	Tennessee	42,000	Vermont	16,114
Indiana	166,766	Oregon	41,599	Florida	15,990
Wisconsin	142,080	North Carolina	39,706	Dist. of Columbia	14,525
Kansas	139,956	Kentucky	38,700	New Mexico	10,995
Massachusetts	133,119	Maine	32,569	Wyoming	9,650
Nebraska	128,142	Montana	31,700	Delaware	9,057
Missouri	125,012	Alabama	29,103	Nevada	6,615
New Jersey	95,315	South Carolina	28,725		
Oklahoma	72,500	Mississippi	26,046	Total	4,242,139

1341 Motor Cars in Japan







Uyeno park abloom with cherry blossoms calls to the Japanese. At right and left are some recent attachment popular with the Japanese motorist

Present Situation in Nipponese Empire Comparable to America 17 Years Ago

By Hi Sibley

THE status of the motor car in Japan to-day is about where it was in America in 1900. In a population of 60,000,000 there are only 1341* motor cars, nearly three-fourths of which are registered in Tokyo, the capital city and metropolis. There is one small, but alert, motor club, and Japan's one and only motor car magazine, *Jidosha*, expired 2 years ago after a heroic struggle to survive motoring apathy. And—this on good authority—there is but a solitary gasoline sales pump in the whole country!

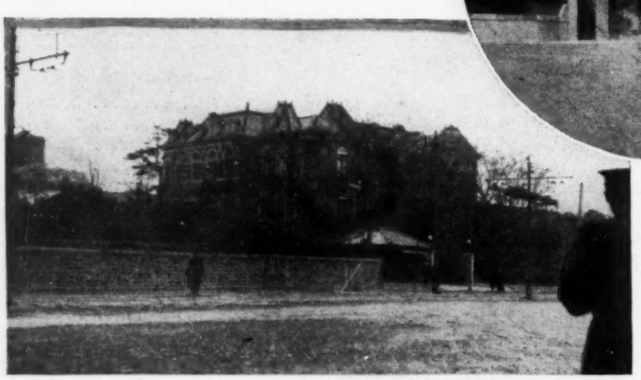
Plainly the motor car has had a hard struggle for existence, to say nothing of expansion. Since its introduction in 1903 it has had innumerable setbacks. Three years ago it was barely getting a toehold, so to speak, when along came the European war and effectually brought its laborious progress to a halt. Prior to that time the intrepid importer of cars had existed largely on optimism, for up until very recently the thrifty Japanese have regarded the motor car as a costly toy. Moreover, the importer virtually had to include a skilled mechanic in the list of accessories, and accept payment on the installment plan, only to discover that, after two or three payments had been made, the original purchaser transferred his title to another individual, thus naively washing his hands of any further obligations. The importer's only recourse was a criminal action, from which procedure he recovered nothing; more than likely he was out court costs and attorney's fees.

Other causes for retarding the advance of the motor car are many and varied. In the first place, the per capita wealth of the Japanese has been very moderate—

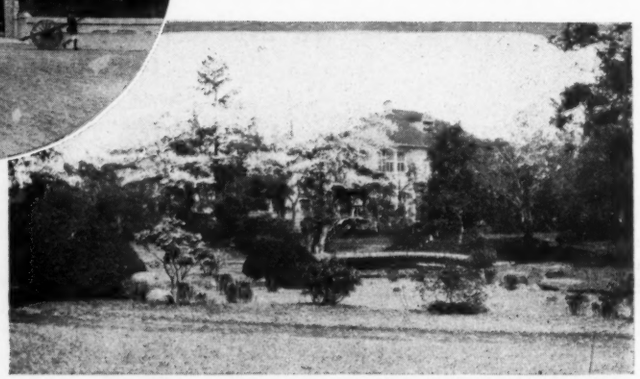
* Figures given by Nippon Automobile Club.

Entrance to American embassy in Tokyo, much visitd by motor cars





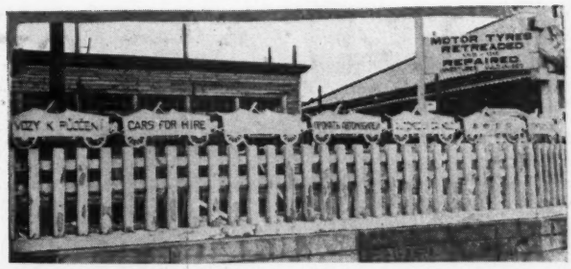
House in which secretaries to the embassy live in Tokyo This was the writer's headquarters



Tokyo club, which has an exceptionally large Japanese as well as foreign membership



"Automobiles Forbidden," or words to that effect in Uyene Park, Tokyo. This sign is a warning to motorists not to proceed farther



A garage man in Yokohama appeals to the trade in six languages. Yokohama has the most cosmopolitan population of any Japanese city and besides, the tourist from steamers that put into that port for one day only find the motor car useful

something like an eighth of that in America—and obviously a very few have been able to afford a car with the, at present, excessive freight rates and 35 per cent import duty. The Ford, for instance, costs the user about 2,000 yen—$1,000—delivered in Japan, while 4,000 yen for a Hupmobile is almost staggering to a people to whom the yen looks bigger than our dollar does to us. Other makes, of course, in proportion.

Japanese Buy in Japan First

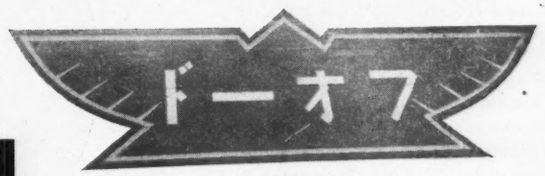
Coupled with this, the Japanese are intensely patriotic—Buy in Japan First! is their sentiment, if not their slogan, and aside from their thrifty habits they have an inherent distaste for letting such comparatively large sums go out of Japan that do not directly develop home industry. Were the cars manufactured in Japan the situation might be altered in a measure, but attempts to manufacture light cars adapted to the country by Japanese concerns have been complete failures, and it is not likely that cars ever will be manufactured in Japan again until American engineering skill combines with Japanese capital, and the import duty on proper materials is greatly reduced. This is the unanimous opinion of prominent Japanese in close touch with the situation.

Then again, the man of means in this country looks upon the motor car more as evidence of prosperity than as a means of recreation. The smarter its appearance the greater its value to him. The car has exhausted its possibilities as a means of luxurious conveyance to city clubs, state and social functions, where it pleases his vanity to arrive in high style. The thought of touring never enters his head; he would not subject his well-groomed car to the mud and rough usage it would receive on the country roads, and admirable as the Japanese are in many respects, our sporting blood appears to be lacking in them entirely, as far as the motor car is concerned. A family party starting out on a picnic expedition with lunch baskets and camera and veils and things is never seen in Japan. Even for short distances between cities the native will not use a motor car when he can take a train or tram.

The price of gasoline is no small obstacle, generally about 45 cents a gal., though there are a dozen grades at as many prices, and this limits extensive use



Motoring on the slope of Fujiyama — disk wheels, teak bearings, solid rear axle—adapted to heavy mountain highways—and an air-cooled engine



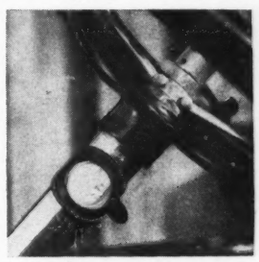


Above is the Ford trademark in Japanese. Below is a sign over a railway station that is supposed to appeal to those who wish to engage a taxicab

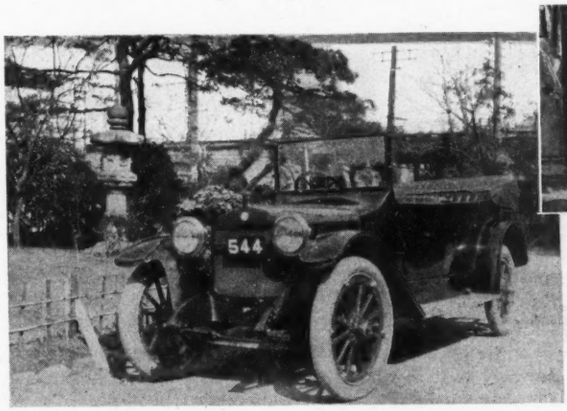
Some Japanese Inventive Genius Is Evident Here



A police inspection plate which is issued to car owners each year if their cars pass inspection



A license tag is attached to the steering column that it may readily be seen by the police officer





At the left is the style of license number used in Tokyo, while above is a Yokohama tag. Next to Tokyo, Yokohama has the most cars of any Japanese city

of the large car to the very wealthy. Except for short runs to the better class watering places and scenic points near Tokyo and Kobe, the amount of country touring is negligible, even among the more sportive resident foreigners, for while many of the roads are excellent, though narrow, and the scenery in the mountain districts unsurpassed, bridges are frequently too frail to withstand the weight of the average car, and usually are washed away entirely during the torrential rains of the summer months. Also, the heavy rains render many of the roads impassable, and often turns are too abrupt for cars of long wheelbase.

Rikisha Monopolizes Trade

The competition, or rather the monopoly of the jinrikisha, locally known as the "kuruma," is a great factor standing in the way of motor car expansion. They are legion in all the cities and towns, and rates are extremely reasonable. Naturally, they are highest at the hotels patronized by tourists from abroad, about $1.50 per day, but generally a native can ride a "ri," or 2½ miles, for 15 to 25 cents in any kind of weather, and as comfortably as he would in a motor car. The kuruma is more adapted to the narrow, crowded streets and abrupt turns of the average Japanese city. If it is cold or rainy, the top, side curtains and storm apron inclose the passenger snugly, and the runner never seems to tire, taking some of the steepest grades at a trot. A great many Japanese maintain private kurumas, whereas to own a motor car he must employ a chauffeur—no owner ever drives his car—at from $15 to $25 a month, and his gasoline account is frequently as much more. In addition to this a motor car license for a 24-hp. car is $60 yearly.



Above—Characteristic military statue in Tokyo park. In circle—A "Godown" or fire-proof vault which is a part of all Japanese homes of the better class. Not much but these remain after fires which are common in Japan

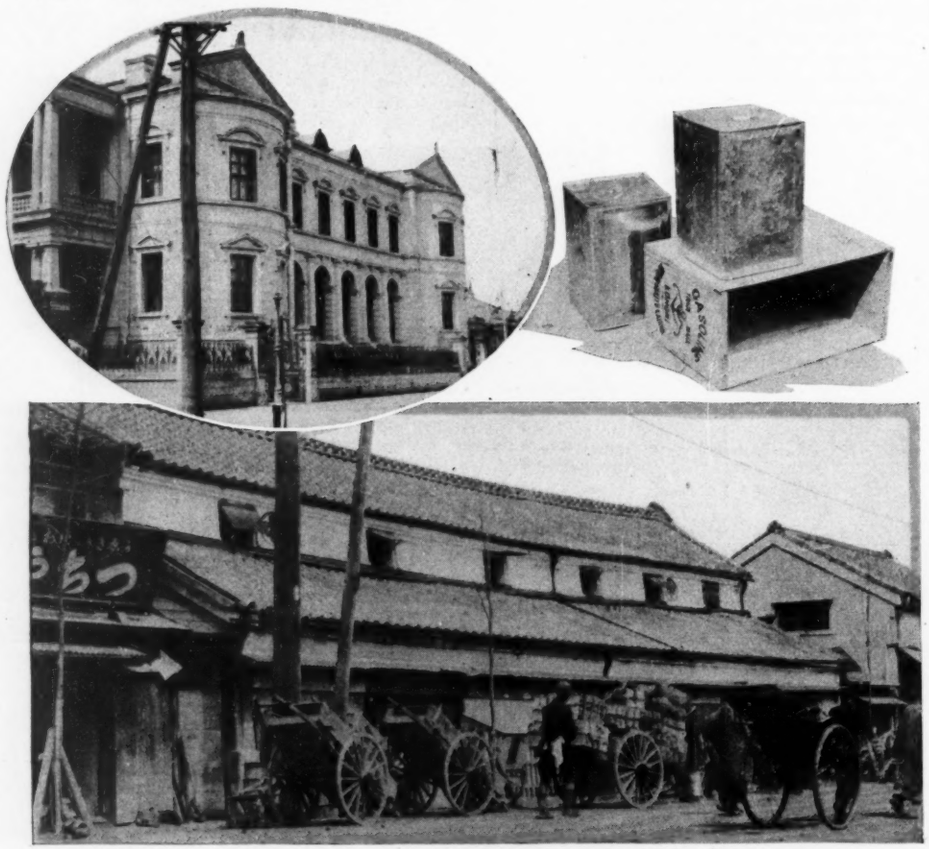
Summing all this up, the motor car has had much to discourage and hamper its general adoption, but the turning point is at hand; importers, both Japanese and foreign, predict a good future for the motor car in this country. The Japanese have more money to-day than they ever had; the war has opened up new markets to them, and they have manufactured and exported a tremendous amount of goods, principally to Russia. Even now the hotels are filled with Russian buyers, American buyers, and even English and Italian. New ships have been added to their trans-Pacific lines where freight and passenger traffic demand has far exceeded every inch of available space; manufacturing concerns have declared the largest dividends in their history and are doubling plant capacity, and banks have reported enormous deposits. Japan is on the high tide of prosperity.

What is more to the point, when the Japanese military attachés return from their observations in the European war zone, where the motor car has been the principal factor in carrying out operations in every line of activity, there is going to be a nation-wide interest in the promotion of the motor which in Japan for all purposes, for the Japanese are not only aggressive, but progressive, and the one national ambition is to occupy a prominent place among the great powers of the world. They deserve the greatest credit.

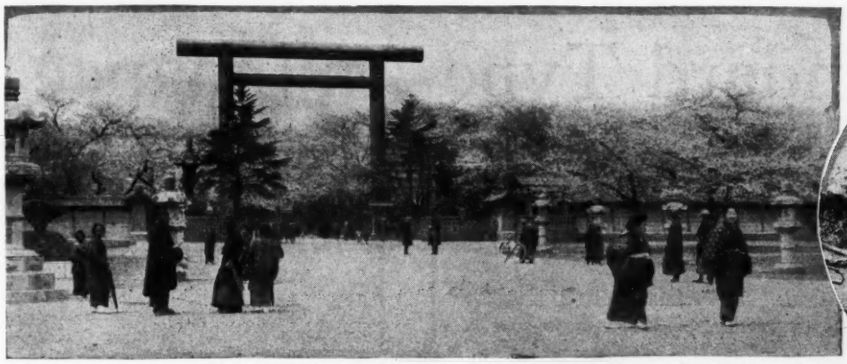
Tokyo Motor Car Center

Tokyo, being the capital and largest city, is naturally the motor car center of Japan. It has a population of 2,250,000 and there are about 950 cars owned in the city, the last motor car census of Dec. 1, 1916, reporting 785 cars, including trucks. Nearly all the privately-owned cars have inclosed bodies, many of the handsomest made in Japan, for the better classes desire privacy wherever possible, and all of them are driven by liveried chauffeurs without exception. In many cases there is a footman as well. Rarely a native buys an open car, but in that case he invariably rides about with the top up and side curtains on, even in the fairest weather. There are few months when the inclosed body is incompatible, for rains are so frequent and heavy, and winters as severe as ours. Besides, in the extremely hot weather of July and August the inclosed body affords protection from the heat as well as from the wind and dust, which are very annoying to the dainty Japanese ladies with their loose kimonos and elaborately arranged hair.

The cars for hire usually are with open body to secure greater passenger capacity, and about 40 per cent of the cars in Tokyo are in this business, which is very lucrative. Rates are from $1.75 to $2.50 per hour, and small garages with two or three cars for hire are found all over the city, principally in the tea house districts, where most of the trade is to be had. The average Japanese chauffeur's driving, however, does not inspire confidence in the tourist, for he will speed through the crowded streets at 30 m.p.h., while kurumas, coolie



In oval—Standard oil headquarters in Tokyo. Above—Wooden cases which hold 5-gal. tins of gasoline. This is the only way in which gasoline is handled in Japan. The opening from the containers must be cut by the buyer. Below—A typical gasoline warehouse. All fuel is stored in cases such as those just mentioned





A "Torri" arch and cherry blossoms at Yasakura shrine in Tokyo, Japan



Above — A garden in the grounds of American embassy. Left — A typical Japanese garden in Yasakura shrine

carts and pedestrians scatter right and left, and terrified mothers snatch toddling offspring from accustomed haunts in the middle of the streets. The city speed limit of 10 m.p.h. does not seem to be inforced in any section, yet in spite of the most reckless driving, the writer has yet to hear a complaint or harsh word from pedestrian or coolie. They seem to regard this strange, shrieking devil-wagon as the acknowledged lord of the highway.

Not Many Cars in Evidence

The foreigner from Europe or America is impressed with the small number of cars seen on the principal streets, some of which, by the way, are the equal of main thoroughfares in American cities. Even in front of the largest office buildings in the modern part of the city one sees rarely more than two cars parked in a whole block, and often not any for several blocks. The writer stood at the intersection of two of the busiest streets, two most frequented by motor cars, and during an hour at noon on a week day counted only forty-three passenger cars and four trucks. Eighteen of the passenger cars were of European make, while among the American cars were fourteen Fords, two Buicks, two Hupmobiles and one each Overland, Oakland, Cadillac, Maxwell, Paige, Hudson and Locomobile. Thirty-nine of the forty-three had inclosed bodies. At a fashionable Japanese wedding thirty-one cars, all inclosed, of nearly as many makes, drew up in front of the Imperial hotel, while there were over 200 kurumas, and it was a cold and rainy night. This is a fair sample of the comparative use of the motor car and kuruma, even among the well-to-do.

Tokyo should be a delight to the prospective motorist, for there are several wide thoroughfares leading to the six principal parks, which in this writing are in all their glory with the delicate pink masses of cherry blossoms. There are innumerable smaller parks and many of the smooth macadam streets are bordered with cherry trees in full bloom, and in addition to this there is no end of Shinto and Buddist shrines and temples and other points of historic interest most conveniently reached by motor car. To be sure, some of the byways in the older parts of the city are very narrow and difficult of navigation by the motorist, but with 180 miles of streets over 24 ft. wide, a motor car can be driven anywhere in the city without great annoyance. A fine of 3 yen, or $1.50, is imposed for driving on streets narrower than 24 ft. without a police permit, but whenever such a street burns down—as frequently happens and with astounding thoroughness—the width is increased in rebuilding.

Notes From Nippon

An American manufacturer of brake lining offered the sole agency for his product to an importer in Japan if the latter would place an initial order for 5000 sets. At that time there were only 1300 cars in the empire.

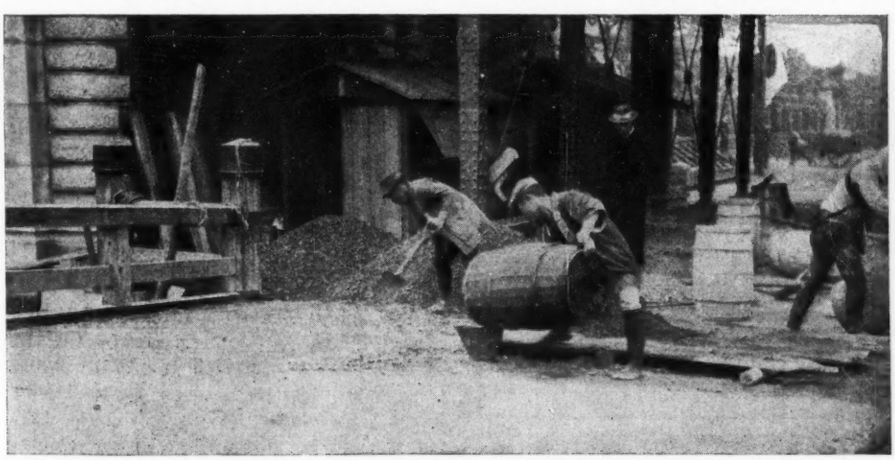
The import duty on cars originally stood at 50 per cent, but the French government protested so effectively that a concession of 15 per cent was made if the car was accompanied by a certificate of origin. Later this was extended to all other nations having commercial treaties.

Akita, a city of 36,000, in one of the northern provinces, has only one car, a Ford. It is said that on account of the condition of the roads in the vicinity, this car's peregrinations are pretty much restricted to the main street of the town.

A number of dealers have found it very profitable to purchase second-hand chassis of good condition in America, and fit them with Japanese bodies for resale. Some of these jobs have as smart an appearance as the very latest models.

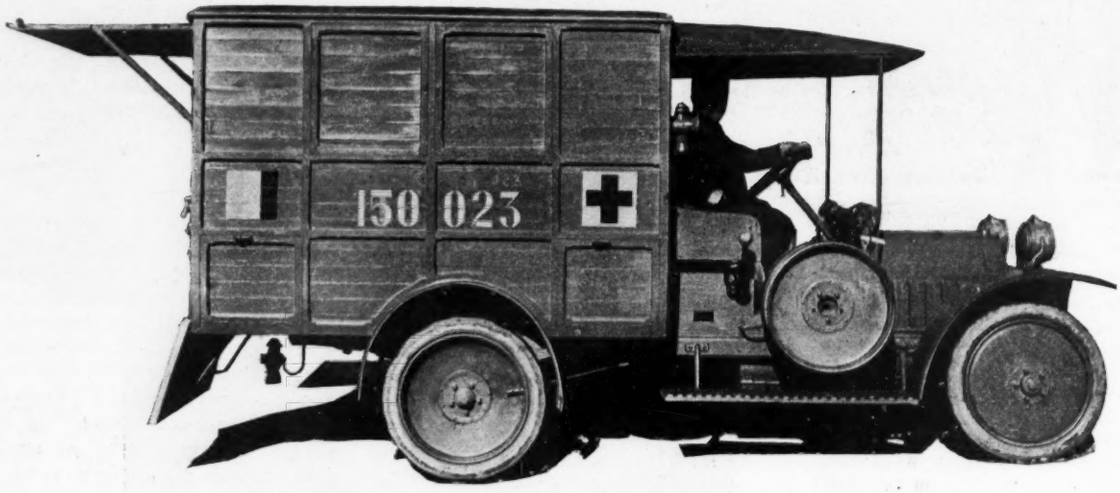
The cyclecar was introduced into Japan a few years ago, and it was thought to be admirably adapted to the road conditions, but it fell into disuse, rather from mechanical shortcomings than design.

Few instances of molestation by country people are reported by motorists, although in some section youngsters have annoying habit of throwing pebbles at the passing car. An American moving picture man reported some trouble with three Japanese on a country road, but they were intoxicated. They paid no heed to the warning signal, and the chauffeur gradually brought the car up against them, whereupon they attacked him with switches. He happened to be an athletic individual and routed the three with his fists.



A recent improvement in Tokyo. Wooden bridge being surfaced with concrete for motor car use. The street improvement germ sown by motor cars has reached Japan

France Has Standard Type Ambulance



Standardized type of French army ambulance for field service

15-H.p. Fiat Carrying Five Stretcher Cases or Eight Sitters Is Adopted for Use Under Tri-Color Flag

By W. F. Bradley

THE standardized type of field ambulance adopted by the French armies is a 15-hp. Fiat carrying five stretcher cases, or eight sitters. The engine is a four-cylinder block-cast of 3.14 by 5.5-in. bore and stroke, giving 171 cu. in. piston displacement. It has shaft drive, with four speeds ahead and one reverse and is equipped with steel disk wheels fitted with pneumatic tires, 32 by 4½, the rear being twins. There are two spare wheels for each ambulance.

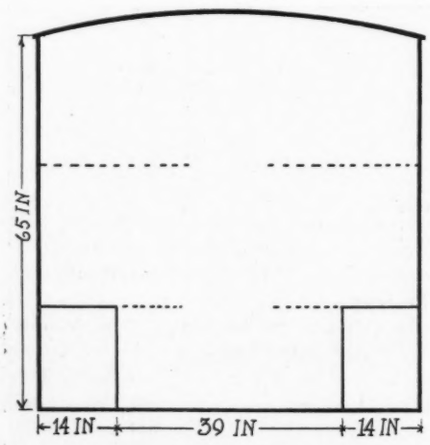
It is not suggested that this is the only suitable chassis, although it is the one most largely used. Experience has shown, however, that this type of chassis is the smallest which can be relied on for all around work, and that with a suitable type of body it will carry the largest loads feasible under road conditions at the front.

Maximum Limit Changed

At the beginning of the war it was considered that a load of four stretcher cases was the maximum with any ordinary ambulance. Sitting cases never presented much complexity and it did not matter greatly whether the ambulance carried eight, ten, eleven or twelve patients. In many cases, however, while accommodation could be provided without much difficulty for eleven sitters inside, there was no room for more than four stretchers. The Italians endeavored to solve the stretcher cases by adopting a more powerful chassis, the engine being 3.9 by 5.5 in. bore and stroke, and fitting a very high body which would receive six stretchers in two vertical rows of three. The disadvantages of this were a very high body which would not always pass easily under low bridges, gateways and other obstructions; also a top-heavy vehicle which swayed violently when driven at speed on shell destroyed roads.

The French have succeeded, in their standardized type, in providing accommodation for five stretchers with a smaller vehicle than that used by the Italians, also with the use of an engine having 92 cu. in. less piston displacement, this latter point being of great importance from the economical standpoint, where thousands of vehicles have to be dealt with.

It has only been possible to get down to an engine of this size when the entire vehicle has been correctly designed and close attention given to total weight, rear overhang, and gear ratio. The writer, for example, has been on front dressing station work with this same chassis equipped with a very handsome and comfortable four-stretcher ambulance body, but because of great dead weight and incorrect gear ratio, the vehicle was a very indifferent success and would have been a failure if given out indiscriminately to army drivers.



End plan view of Buick ten-passenger, four-stretcher ambulance

All-Wood Body Best

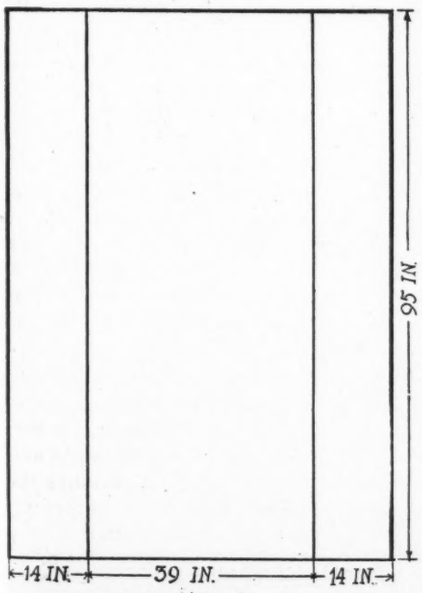
The all-wood body has proved the most suitable for field service. On the Italian front a certain number of Buicks and G. M. C.'s are employed with a wood frame canvas covered, there being an outer and an inner layer of canvas, and a canvas roll cover at the rear. Merely from the weight standpoint, these are very advantageous. Canvas, however, is not sufficiently durable for work at the front. Under rough and crowded road conditions the canvas sides were constantly being torn by the overhanging branches of trees, or by the overhanging loads of other vehicles. Further, painted canvas is difficult to keep clean. In summer time the only method of giving air was to leave the rear flap rolled up. An all-wood body with sheet metal outside proved durable, and always presented a smart appearance, but this construction made a body too heavy for the size of engine now used.

In the French standardized body there is only one thickness of planking, dovetailed so as to give a smooth inside surface. All the interior is painted white and varnished. With a view to cleanliness the smoothest possible interior is important. Trench mud is the least objectionable kind of dirt to be cleaned out of ambulances working at front line dressing stations. As will be seen from the photographs and

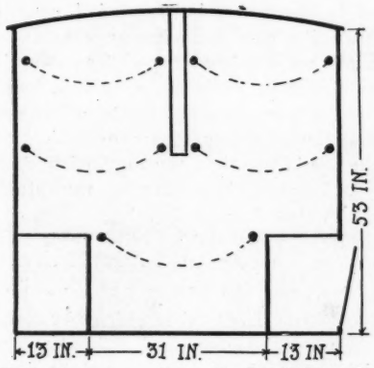
drawings, there are two seats placed longitudinally in the vehicle; they carry an imitation leather cushion and have a backrest of the same material. These seats, which will comfortably carry four men side by side, although five can be accommodated in a pinch, are completely boxed in. This arrangement allows four large capacity lockers to be built under the seats, one at each corner of the body, entrance to them being from the outside. This is a very practical arrangement, for it gives the driver two lockers for tools, jack, spare oil, etc., and two lockers for his own kit. As, under front-line conditions, the driver may have practically to live on his ambulance, some provision must be provided for his kit. It has been found, too, that if space is left under the seats, it is very rarely used by wounded men for carrying their kit, and this space also adds to the difficulty of keeping the car clean. This arrangement therefore gives locker space which otherwise would not be used. The center portion of the space under the seats is occupied by the rear wheels, for the body is the full width of the chassis.

How Body Is Divided

The body is divided down the center by two pairs of steel tube rails attached to the front body panel and at the rear to a vertical beam descending from the roof. There are two similar rails on each of the sides of the car and one in front of each seat, going under the men's knees when sitting cases are carried. On each of these rails is mounted a grooved pulley and an endless girth with a coil spring attachment, also a second girth, spring mounted, but without a pulley. The forward arms of the stretcher are passed into the pair of pulley mounted girths, the stretcher is pushed ahead, and the other two girths slipped over the rear arms of the stretcher. Two of the stretchers are very close to the roof; two others are just below, the bottom of the stretchers only just clearing the



Floor plan of four-stretcher, ten-passenger Buick ambulance



End plan view of standardized French army ambulance on Fiat chassis

seats; and the fifth stretcher is exactly in the center, between the two seats.

This arrangement not only saves time in loading, but it avoids jars to the patients. On many of the earlier ambulances the seats were folding and on being opened out each presented a pair of hollow rails to rereceive the stretcher legs. Two metal frames hinged to the walls could be lowered to provide two more pairs of rails. There is always a tendency for the stretcher legs to wedge in these rails, and to avoid jerky movements one man must be inside to ease the stretcher along. This necessitates a minimum of three men—one for the front end of the stretcher and two for the rear. With the new French type it is not necessary for any man to be inside; when the forward stretcher arms have been slipped into the girths, the entire stretcher can be pushed ahead with ease. These loading arrangements are very important, for in badly-designed ambulances wounded men are often hurt more by being lifted into and taken out of an ambulance than by the actual journey. Wounded men often view an ambulance journey with fear; their fears are more likely to be justified in the loading than in the actual journey.

No Attendant Carried

One of the old-time rules of ambulance design was that there should be a central passageway between the two rows of stretchers, and a seat at the head of the ambulance for an attendant. In practice no attendant is ever carried inside an army ambulance. The writer assisted in the transportation of several thousand wounded on the European front, and except in a few rare cases where a high staff officer was the victim, the wounded were transported without an attendant. Other exceptions were a few cases of men who went raving mad under shell fire, but these exceptions do not call for any modification of the design.

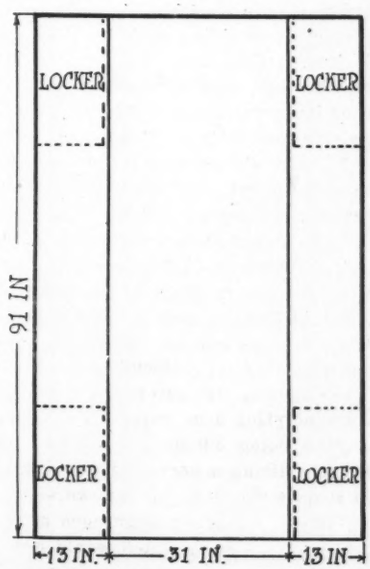
In this standardized type of ambulance the lowest pair of rails are much farther apart than the width of the stretcher. This is no disadvantage, for the girths can assume any angle, and need not necessarily hang vertically. In certain cases a wounded man is placed on a mattress obtained from some wrecked house, and it is considered advisable to keep him on this mattress until he reaches the hospital. The extra width between the two lower rails allows this to be done; the mattress being wider than the stretcher, obviously could not be carried on the upper rails.

The rear door is in two parts, hinged top and bottom. This arrangement is preferable to doors hinged in the ordinary way, for the latter are apt to fly open when traveling, with ill results to all concerned. Canvas doors are not at all satisfactory. For summer use fresh air can be given by opening the two center upper panels on each side of the body, each of these panels hinging back and folding against the end panels. There are two glass windows at the front, immediately behind the driver and the mechanic. Windows are least liable to breakage in this position; they are also necessary in order to enable the driver to ascertain what is happening inside.

Injured Asphyxiated by Heater Fumes

It has been found essential, on most portions of the front, to heat ambulances when in winter service. This has been done in the standardized French type by fitting a metal box in the floor, and flush with it, the full length of the body, and about 8 in. wide. The exhaust gases can be turned directly into this box and are evacuated at the rear. With a completely-closed, all-wood body the degree of heat obtained is quite sufficient for all conditions. It is most essential, however, that this heater be well made; cases have arisen where, owing to defective workmanship the exhaust gases have leaked into the ambulance and asphyxiated the patients.

From the driver's standpoint the equipment is simple but satisfactory. There is a fixed canvas top above the driver's seat, supported at the front by steel uprights bolted to the dash at their base. Apart from the question of solidity these uprights are useful as a protection for the driver when wires have been hung across the road. There are waterproof curtains which



Floor plan of French army ambulance on Fiat chassis

when not in use roll on the top and sides of the dashboard and also in the top; they enable a practically closed cab to be obtained in bad weather. There is a short, wood running-board at each side. Above the right-hand running-board two spare disk wheels are mounted; on the left-hand running-board is the acetylene generator giving gas to two headlights mounted in the usual position, also a box to receive two spare cans of gasoline. The gasoline tank is under the seat, but is not sufficiently high to give gravity flow on hills. Pressure is maintained from the exhaust, with the addition of a hand pump on the dash. This is the only feature about the ambulance open to criticism, for water condenses in the manifold and passes to the tank and the carbureter. A Pyrene fire extinguisher is carried on the front panel of the body, to the left of the driver. This is an obligatory and essential fitment on all French army cars, and on most Italian vehicles.

In addition to the headlights, there are two side lamps. It will be noticed that they are mounted on the forward face of the body, to left and right of the driver, and indicate practically the full width of the vehicle. This method of mounting is a detail of very practical value; there is a glass disc in the rear of each lamp registering with a circular hole in the body panel; thus the lamps show a light ahead and inside the ambulance.

Inside Lighting Problem

There have been many unsatisfactory solutions of the inside lighting problem. Electricity is both too costly and too delicate for the average ambulance driver at the front. Even on ambulances like the Buick, fitted with Delco ignition and lighting, the inside light always gave a considerable amount of trouble owing to bulb breakages and shorts.

Although there is a rear overhang, beyond the center of the axle, of 41 in., these ambulances are remarkably well sprung and have better riding qualities than many high-class touring cars. The addition of a shock absorber, such as the Houdaille, still further improves them. This, however, is not a standard fitting. Final gear ratio is 5 to 1; this with a four-speed gearset is quite satisfactory, and enables the ambulances to meet any conditions of front-line work to be found on the western front; obviously, however, a judicious use has to be made of the gears. Most of the Buick ambulances in France have a final ratio of 6 to 1, with three speeds. With the bigger engine and this ratio they are practically top gear cars in all ordinary country, and are faster than the Fiats on moderate hills. For really difficult hill work, however, their three speeds handicap them and make them inferior to the Fiats.

The Buick chassis is the American machine most commonly used by the various European armies and the Red Cross associations attached to the armies. The bodies fitted to these chassis are varied, some of them being poor and some approaching the French standardized type. The American Ambulance in Paris has a certain number of these latter in service. As will be seen from the sketches, their overall dimensions are larger than the regulation French type. Further, they carry but four stretchers, the stretcher carriers being formed by the hinged seats and by rails hinging from the walls. The loading arrangements are inferior, for the stretchers have to be pushed in on fixed rails, which always presents a certain amount of difficulty. These Buicks are registered to carry eight sitters; in reality many of them run regularly over rough roads with thirteen sitters—five each side, one at the head of the gangway, one in front, and driver—without being any the worse for it. As stretcher cases are the most difficult to handle, a modification of these bodies to take five stretchers would be a vast improvement.

Road Work in Swampeast Missouri

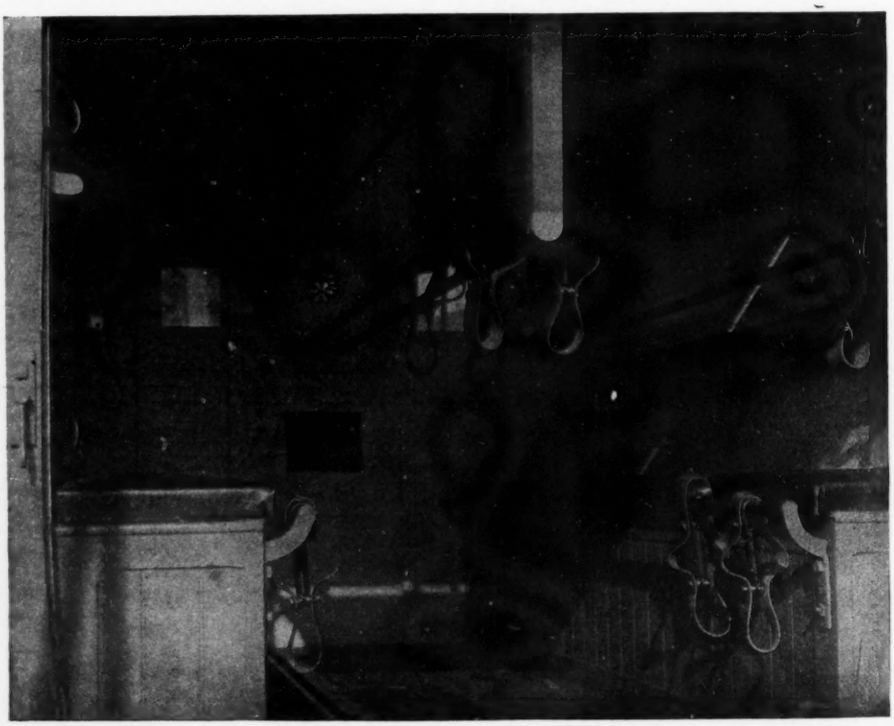
A SHORT news item bears notice that three counties in Missouri, Mississippi, Scott and New Madrid, recently voted $375,000, $750,000 and $800,000 respectively bonds for roads. This issue of almost $2,000,000 is worthy of attention by other counties in the Union, and through the courtesy of one of MOTOR AGE's readers, C. F. Bruton of Sikeston, Mo., it is possible to indicate the situation resulting in this provision for highways, just now when good roads are so necessary both in keeping the lines of transport open between the various cantonments and forts and adjacent towns and in helping conserve the food of the nation by making more simple the marketing of food.

The land through which these roads are to be built is in what for years has been called Swampeast Missouri. The land formerly was a vast swamp. Now, the name fast is losing application, and these roads are to help it lose them even more. The counties are digging 1000 miles of ditches to reclaim all the land termed at one time a swamp. It is a great motor car country. The farmers are very wealthy and all buy cars, some three or four.

The country is different from most farming communities in that farmers there never retire, no matter how much they are worth. Land has advanced as much as 6000 per cent in the last ten years. When farmers make as much as $100 an acre on one crop and get two crops off the same land the same year there is no reason for their not enjoying good roads and motor cars. The people of that section expect to make King's highway, the oldest road in the state, a paved road from the Arkansas line to St. Louis. A gravel road runs most of the way to St. Louis now, and when this system of roads is complete traffic will be even heavier than it is.

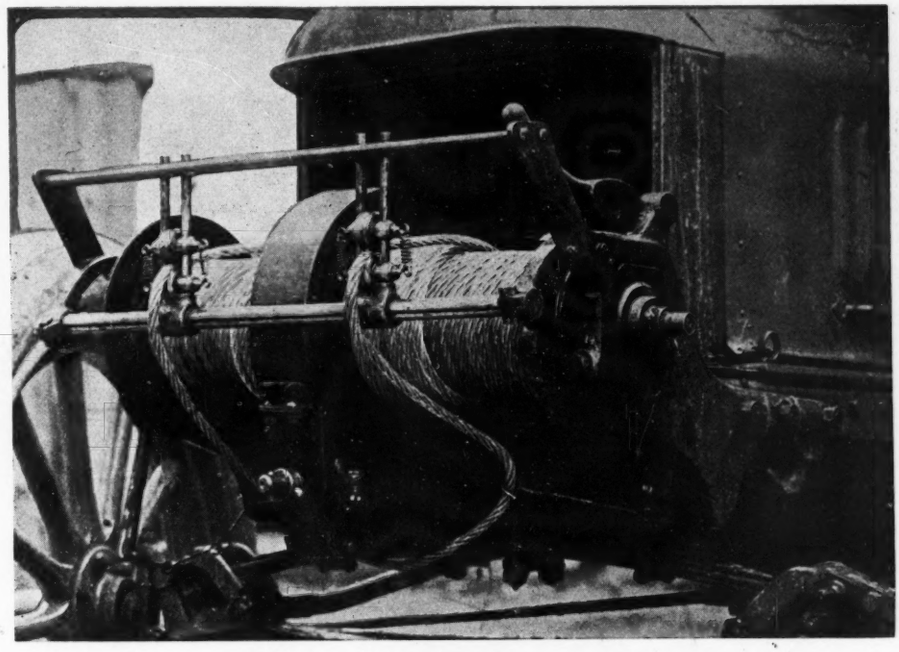
Good roads work is being pushed rapidly in the section. The movement started with the commercial club of which our reader, Mr. Bruton, is president, and has done much to improve good roads. Says Mr. Bruton:

> We are sure that the commercial clubs all over the country are missing their opportunity when they fail to promote good roads, for as surely as the National safety and future rest upon the farmer and farming, just so sure does our National future rest upon good roads to the farm. There is a great lesson in the article by Bradley in your recent issue regarding the saving of Paris by good roads, and every community should read this article publicly so they may get it digested and into their systems, for it will come to us some day when too late, if we do not look after our national highways.



Interior view of French army ambulance, showing how five stretchers are carried

Ford Fixed to Haul Cannon



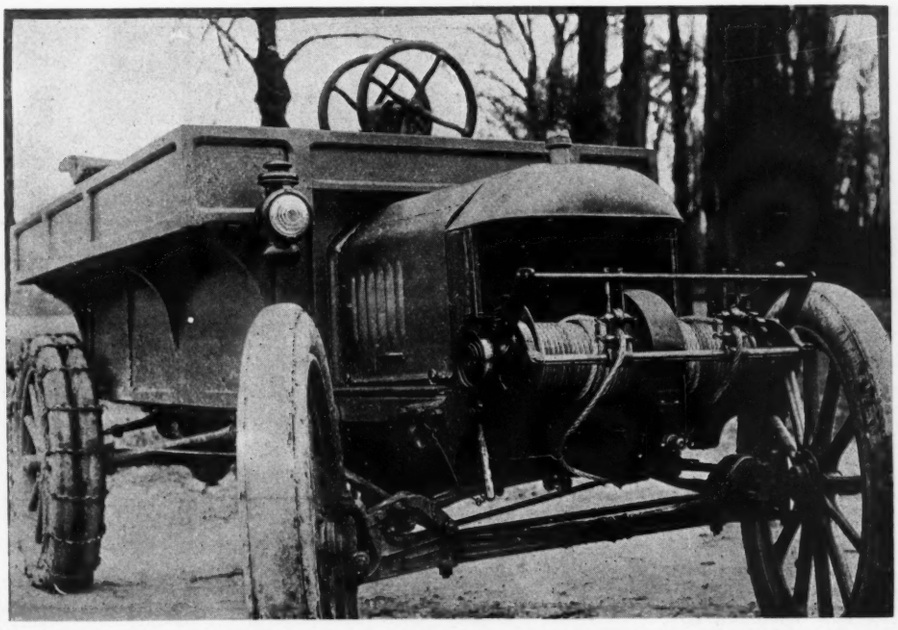
This gives details of the winding drum and its operation

AN ordinary Ford chassis has been modified to act as a tractor in connection with artillery batteries in the Western front in Europe. The transformation has been carried out by an artillery officer who has had considerable experience in gun transportation with all kinds of European and American tractors specially built for this class of work. As the result of observation the officer was led to the conclusion that what was needed was a very light tractor capable, by reason of its lightness, of traveling over all kinds of broken country and of getting into position which could only be reached by heavier machines at the expenditure of considerable time and labor. The tractor was intended to do most of its work through its winch, and not by direct haulage. Such a machine would show its greatest usefulness in the final placing of guns, rather than in haulage on the roads. The work of placing guns is now done by the big tractors, but as they are heavy and cumbersome machines they do not show their greatest usefulness in this sphere. The light Ford type, being able to move about quicker and to operate in much more cramped quarters, would, it is claimed, be a more suitable machine for placing guns.

The transformation comprises the widening of the tread, the fitting of larger diameter wheels with twin pneumatic tires on the rear, the adoption of radius rods for front and rear axles, the fitting of double steering and control, the placing of the winch across the front of the frame, and the increasing of the radiator capacity.

As shown in the illustrations, the winch is carried in brackets bolted to the front end of the frame. Power is transmitted from the front end of the crankshaft to the winding drum by worm gearing giving a very low reduction. The gearing is incased. Sixty yards of steel cable is used, it unwinding from one half of the drum and winding up on the other. A powerful ratchet and pawl is fitted and there is also a friction brake on the drum.

Double steering and control have been adopted. The steering has been very neatly carried out by retaining the standard Ford steering column but mounting a short horizontal shaft on its head, with a bevel pinion meshing with a corresponding pinion on the column. There is a vertical Ford steering wheel at each end of this shaft. The three Ford pedals have been duplicated. For reverse work the driver merely changes over from the facing-forward seat to a second seat ahead of the steering column, where he finds a steering wheel, throttle and ignition control and a set of pedals facing him. The tractor has been tried out under severe tests.



This shows the winding drum for artillery haulage fitted to a stock Ford

Converting the Nevada Desert



A good road relieves the loneliness of long stretches of sand and sagebrush. Recently $2,000 worth of steel culvert have been installed by the Nevada desert tamers to help bring good roads

A THOUSAND motorists and other good roads workers are banded together out in Nevada for the righteous purpose of building a road that will greatly lessen the soul-saving responsibility of the Rev. William A. Sunday et al. They declare they are going to put a stop to a heap of powwow to the effect that "hell holds no terrors for a fellow after a trip across the desert in Nevada." They also claim their state already is too hot without having the atmosphere further charged with superheated "cusswords," and they announce a teeth-gritting determination to provide comfortable travel for motor tourists wise enough to take the Overland trail. Besides, they are working in a practical and optimistic way that means business.

This being-improved route crosses the state through Tecoma, Montello, Cobre, Wells, Deeth, Halleck, Elko, Carlin, Beowawe, Battle Mountain, Golconda, Winnemucca, Mill City, Imlay, Oreana, Lovelock, Wadsworth, Reno and Verdi. About half of its 455 miles is through desert land, but the longest stage between supply stations is only 45 miles, and this stretch has three points where water can be obtained. The road follows closely along railroad, telegraph and telephone lines the entire distance across the state, being only 10 miles away from a railroad at the farthest point. This one feature means a great deal toward removing the dread of desert travel, as the average motorist is not yet too independent to welcome an occasional opportunity to wave at railroad travelers on a drive of nearly 500 miles across a country necessarily rather monotonous and even lonely in many respects. And if you do happen to have a breakdown—as transcontinental tourists sometimes do—it is rather pleasant to feel that a telephone or telegraph station is within reasonable reach. Then there is the need of water, which is supplied in plenty all the way across Nevada along this road. It is called the "Safety First Road," and a big signboard near Reno announces, "This Road Goes Through Civilization."

In reality there is not nearly so much "desert" along this road as is commonly imagined, although it does travel vast expanses of sand and sagebrush. Towns and villages are fairly close together along the road clear across Nevada, and many of these represent metal mining, stock raising and other industries on a large scale. The desert impression is also modified considerably by the fact that the Humboldt river runs along near the road most of the way. One important result of this lay of the land is the absence of high summits and steep grades. There are hills here and there, but they all have gradual, easy slopes, and there are no mountain ridges or similar high, steep summits of any kind. The greater part of the 200 miles of "desert" is grazing land.

The route is termed "natural" because it follows the least-resistance grades of the river course and also because it traverses the same course adopted as logical from an engineering standpoint for constructing and maintaining railroad, telegraph and telephone lines. It uses an old railroad grade for more than 150 miles, and this makes an excellent foundation for building a highway.

The organization promoting this enterprise is called the Overland Trail Club.



Tractor crews appeared on the Nevada desert. Good stretches of road followed them

Although formed less than five months ago, it has 1000 members, has put in $2,000 worth of steel culverts, conducted five good-roads days of practical work with from seventy-five to 125 volunteers, paid for fifteen days of tractor dragging and made substantial improvements on 55 miles of road in the last few weeks. Now the improved road needs a winter's rest to give the dirt loose from dragging and grading a chance to settle and get firm. In spite of heavy dust and deep ruts, however, this road is given preference across Nevada by motoring organizations in California, Utah, Colorado and other states. It has been designated as Route No. 1 by the new Nevada State Highway Commission and accepted as a link of the Pike's Peak Ocean-to-Ocean highway.

Two and a half million dollars will be spent on Nevada highways in the next few years. The state and Federal governments each will provide $1,000,000 of this fund, and the counties will raise $500,000. The Overland trail promoters will work hard to make their road deserve a substantial share of this money, and they are hoping for a highway of turnpike and gravel construction that will make the touring motorists think less about the sand and sagebrush and more about the nearby valleys and distant foothills, the grazing herds, the hospitable settlements, the ample water supply for all traveling needs and the rich mines of gold, silver, copper, tungsten, zinc and antimony.

An enormous amount of work is needed, but these Nevada people are neither shirkers nor bluffers, and they are counted upon to keep their promise to good roads workers from the ten other states traversed by the transcontinental highway that sweeps past the base of historic Pike's Peak.

Route Information

EDITOR'S NOTE

MOTOR AGE outlines route itineraries for its readers by letter. Each week only a few of the routes asked for are published, these being those of more general interest. In asking MOTOR AGE for routes, write your name and address distinctly on a return envelope.

Chicago to the Dells

Chicago — Editor MOTOR AGE — Outline routes from here to the Dells.—E. C. P.

Chicago, Elgin, Algonquin, Harvard, Janesville, Madison, Baraboo, Kilbourn.

Chicago, Wheeling, McHenry, Lake Geneva, Janesville, Madison, Baraboo, Kilbourn.

Chicago, Wheeling, McHenry, Lake Geneva, Millard, Fort Atkinson, Madison, Baraboo, Kilbourn.

The latter is the most popular route. There is no road construction work going on that we know of.

Vol. 5 of the Automobile Blue Books, published at 910 South Michigan avenue, contains complete running directions for this trip.

Indiana to Minnesota

Fort Wayne, Ind.—Editor MOTOR AGE—Give route from Fort Wayne to St. Paul, Minn., via the Wisconsin Dells.—F. C. S.

From Fort Wayne drive to North Manchester, Disko, Akron, Athens, Rochester, Richland Center, Culver, Winona, North Judson, San Pierre, Dunn's Crossing, Valparaiso, Merrillville, Schererville, Highland, Chicago, Niles, Wheeling, Wauconda, McHenry, Genoa Junction, Lake Geneva, Elkhorn, Millard, Whitewater, Fort Atkinson, Cambridge, Madison, Waunakee, Dane, Lodi, Okee, Merrimac, Baraboo, Dolton, Kilbourn, the Dells, Plainville, Quincy, Holmesville, New Rome, Grand Rapids, Plover, Steven's Point, Auburndale, Marshfield, Spencer, Unity, Abbotsford, Owen, Withee, Thorp, Stanley, Chippewa Falls, Eau Claire, Menominie, Knapp, Baldwin, Roberts, Hudson, Lakeland, Minn., to St. Paul.

Vols. 4 and 5 of the Automobile Blue Books, published at 910 South Michigan avenue, Chicago, contain complete running directions.

Wisconsin to Oklahoma

Brodhead, Wis.—Editor MOTOR AGE—Give a route from here to Tulsa, Okla.—H. D. M.

Go by Janesville, Beloit, Rockford, Byron, Dixon, Peoria, Springfield, Litchfield, St. Louis, Union, St. Clair, Anaconda, Stanton, Sullivan, Leasburg, Cuba, St. James, Rolla, Edgar Springs, Licking, Raymondville, Houston, Simmons, Cabool, Dunn, Mountain Grove, Norwood, Macomb, Mansfield, Seymour, Diggins, Forland, Rogersville, Galloway, Springfield, Republic, Billings, McKinley, Marionville, Aurora, Verona, Pierce City, Wentworth, Diamondville, Joplin, Galena, Lowell, Baxter Springs, Lincolnville, Commerce, Miami, Venita, Catale, Chelsea, Bushyhead, Sequoyah, Claremore and Collinsville to Tulsa.

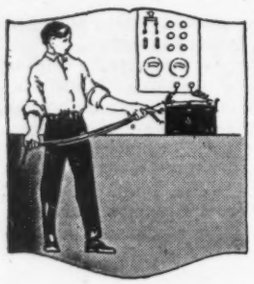
Vol. 5 of the Automobile Blue Books contains complete running directions as far as Joplin, Mo.; from there on use Vol. 7.



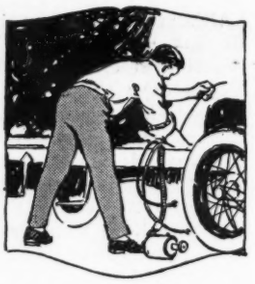
President W. H. Goodin, of the Overland Trail Club, delivering one of the new highway culverts



A badly needed culvert and large fill were put in by volunteer workers on one of the recent good roads days in Nevada, and a much "cussed" piece of road was made fit to travel without the aid of the Reverend Billy Sunday



Electrical Equipment of the Motor Car



By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the fifty-ninth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. Electric motors and engine and motor connections then were considered. Ignition was taken up next.

Part LIX—Magneto and Battery Ignition Systems

SINCE there is both a mechanical and electrical lag in the results obtained from the ignition spark, it is readily seen that the same setting of the spark which will give maximum efficiency at say 500 r.p.m. will be quite a bit too late for a speed of 1000 r.p.m., and the spark would not then take place until the piston had started on its downward stroke and the pressure had dropped considerably, causing a very noticeable loss in power. Likewise, if an attempt be made to run the engine at a slow speed with the spark accruing at a time which gives the best results for high speed, there will be a marked loss in power, due to the fact that the explosion of the gaseous mixture takes place against the rising piston. This condition of affairs is indicated by a decided hammering sound in the engine cylinders. In the majority of ignition systems means are provided for advancing and retarding the time of the spark in relation to the position of the piston. This change in spark position in the great majority of systems is accomplished by moving a lever, called the spark lever, which is within easy reach of the operator, while in some it is accomplished by an automatic device whose operation usually depends on the centrifugal action on one or more weights. In some cases the automatic and manual means are combined, and in a few no means of changing the position of the spark is provided at all.

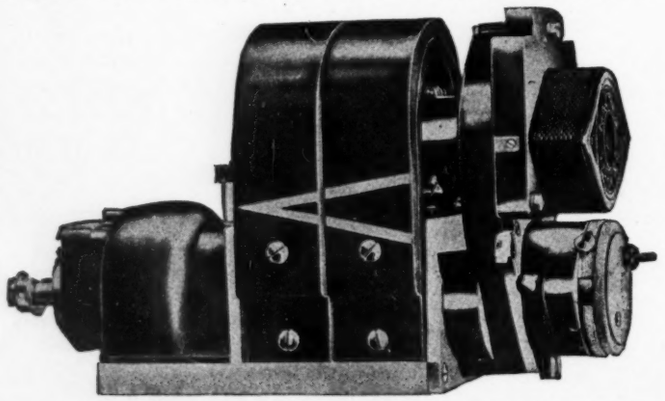


Fig. 326—Eisemann device for advancing and retarding spark automatically



Fig. 327—Eisemann high-tension magneto and automatic timing device complete

A centrifugal device for advancing and retarding the spark automatically as conditions may require is shown in Fig. 326. The complete magneto with the automatic timing device is shown in Fig. 327.

A convenient chart for determining the relation between the spark advanced in degrees for different piston wheels in inches with engines having strokes varying in value from 3 to 8 in. is shown in Fig. 328. The chart may be used as follows: Assuming the spark is to be advanced 30 deg. in an engine having a 6-in. stroke, to find the amount the piston should travel trace the vertical line corresponding to the stroke in inches until it intersects the sloping line corresponding to the 30-deg. line, and then follow the horizontal line to the left, which brings you out just a little below the ½ in. division. The piston then would have to travel a little less than ½ in. below the uppermost position and moving upward in order that the spark have a 30 deg. lead.

Ignition Systems

The fundamental principle of all battery ignition systems, together with the main component parts, is shown diagrammatically in Fig. 329. The electrical circuits for convenience may be spoken of as the low- and high-tension circuits, or the primary and secondary circuits respectively. The primary circuit consists of the following main parts, starting at the positive terminal of the storage battery and tracing along the circuit in the direction of the curves: The low-tension, or primary, winding of the induction coil through the stationary and movable interrupter contacts and back to the negative or grounded terminal of the battery. The high-tension circuit consists of the following parts: Starting with the ground connection, you pass through the high-tension, or secondary, winding of the induction coil to the center contact of the distributor head, through the distributor brush to the various

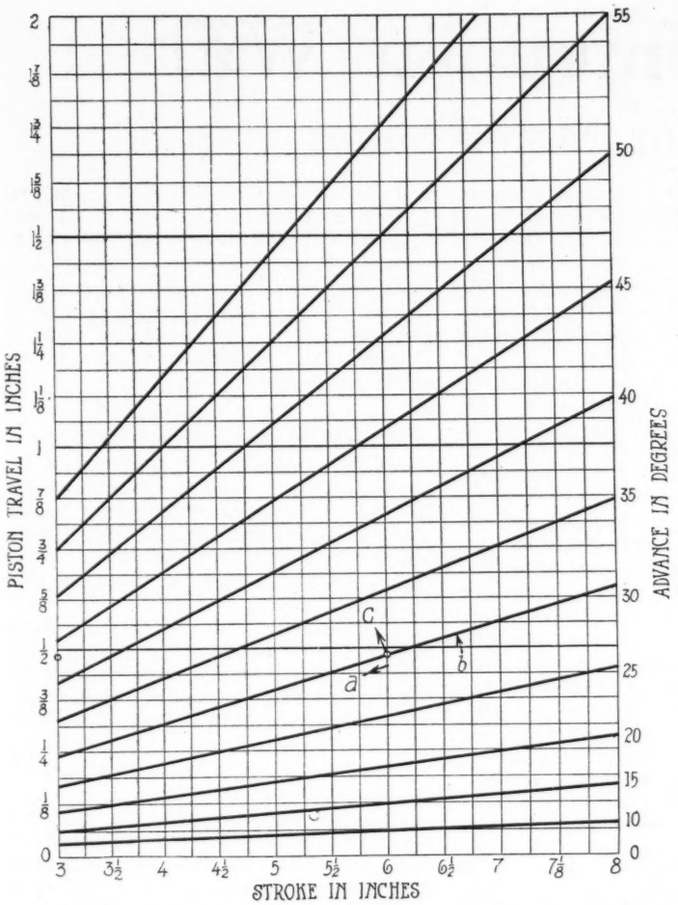


Fig. 328—Chart for determining relation between spark advance and piston travel

contact points, depending upon the position of the distributor brush, to the spark plugs through the spark gap and to ground. In some systems there is a small gap between the distributor brush and the various contact points, and it is necessary that this gap be bridged, in addition to the gap at the spark plugs, whenever a spark occurs in the engine cylinders. In the majority of systems, however, no such gap is provided, and the end of the distributor brush makes actual contact with the various points which are electrically connected to the spark plugs.

Open- and Closed-Circuit

All battery ignition systems may be considered as belonging to either of two types of systems, called the open- and closed-circuit types respectively. The distinction between these two types may be understood readily by reference to the diagrammatic representation of each as shown in Figs. 330 and 331. In the closed-circuit system the ignition contacts normally are closed and the operation of the cam opens these contacts. The contacts are shown in the open position in Fig. 330. In the open-circuit system the contact points normally are open and the operation of the cam closes these contacts directly or through the intermediate action of a system of weights or levers. The operation of the open-circuit system, as shown diagrammatically in Fig. 331, may be considered as taking place as follows: The spring is raised by the cam and suddenly lowered or released and its end strikes the end of the spring carrying the movable contact and thus causes the two contacts to be momentarily in contact with each other. In either system a high electrical pressure will be induced in the high-tension, or secondary, winding of the induction coil where the current in the primary winding is interrupted, provided the primary circuit has been closed long enough to allow the primary current to build up in value so as to produce the necessary number of lines of magnetic force through the secondary winding.

The current in the primary winding does not build up in value to its maximum value instantly, but an appreciable time is required. The rapidity with which the current increases in value after the circuit is closed depends on the relation between the resistance and the induction of the circuit. The higher the inductance and the less the resistance, the greater the time required for the current to reach a certain value, or, in other words, the slower the current builds up in value. The value of the inductance of the circuit in henries divided by the resistance of the circuit in ohms gives the numerical value of what is called the time constant of the circuit, which is the time required for the current to rise to .63 of its maximum value. For example, if a circuit had a resistance of 2 ohms and an inductance of .0005 henry its time constant would be equal to .00025. If a pressure of 6 volts be impressed on this circuit the maximum current would be equal to six divided by two, or 3 amperes, and the current would reach a value of 1.99 amperes in .00025 second after the circuit was closed.

The time constant of an ignition circuit, of course, can be changed in value, but it never can be equal to zero, as it is impossible to reduce the inductance to zero. The intensity of the spark produced will vary its value as the value of the total number of lines of force threading the secondary circuit and cutting the secondary winding when the primary circuit is broken varies in value. Hence, it is desirable to have the primary current reach as high a value as possible before breaking the primary circuit. In the closed-circuit system the primary circuit is opened a less number of times for low engine speeds than it is for high engine speeds, and the duration in time of each interval that the circuit is closed is greater.

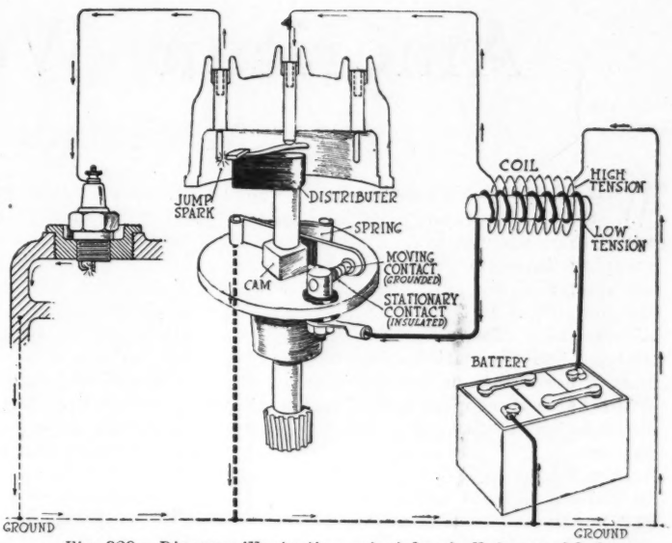


Fig. 329—Diagram illustrating principle of all types of battery ignition systems

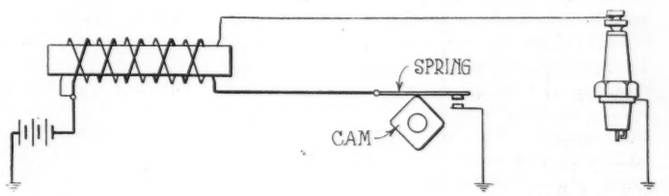


Fig. 330—Diagram of closed-circuit system of ignition, with contacts in open position

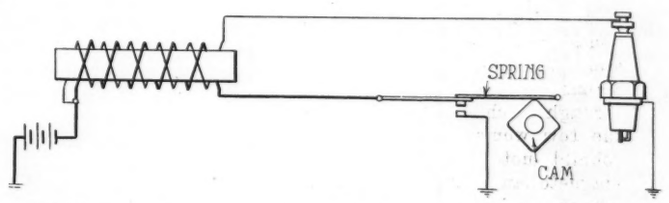


Fig. 331—Diagram of open-circuit system of ignition, with contacts in open position

American Women in War

New Mechanics for Motor Shops

WHILE America's men are being called to the front and drafted into the army, there are women in America who are stepping into the vacancies and filling satisfactorily the positions formerly held by men. This is true in the motor world as elsewhere. Down in Texas one girl of sixteen has the satisfaction of knowing that if her father or brother is called she will be able to support herself and mother through her ability as a motor car mechanic.

Miss Norine Nealy of Royse, Tex., is said to have a natural ability for mechanics and has developed that ability to such an extent that she can run her car by ear, that is, can tell whether anything is wrong with the engine by listening to it run and so on. She always has liked to tinker with machinery, and when her father first brought home a car she was not long in discovering just how and why it ran. She took up the study of the motor car and before so long was able to be the repair man herself. She not only is acquainted with a tire but with the batteries and the spark plugs. When she goes to work on any part of the car she goes at it hard, overalls, tool box and all.

Can Rebuild Cars

Miss Nealy is a descendant of Pocahontas and a fourth cousin of Daniel Webster. Just now she is making her own claims for distinction among women through mechanical ability, being one of the few women who can take apart and rebuild motor cars. She is ranked as a magneto and carbureter expert by those who know her, and to say this is to say the last word practically in motor car repair work.

Going a long way from Texas, there is Miss Mary Mayer, of Sayville, L. I., who has taken over the garage business for her brother, Joseph Mayer, now an airplane machinist in the Army. Soon after Mayer was offered the position as airplane machinist Miss Mayer entered the shop to learn the business from the bottom up. Today she has complete charge of the establishment, as her brother's furlough, given him to afford opportunity to settle his business affairs, has ended.

The West long has claimed the majority of women experts with the motor car. The most recent proof advanced for their claim is the record run made by Miss Bess McCune, who has volunteered for American ambulance service abroad, from Salt Lake City to Evanston, Wyo., in 2 hr. and 38 min. Miss McCune regards this as the finishing touch for her motor car education before leaving for the front. She has driven cars for years and is considered an expert. During the last few weeks she has been at a service station in Salt Lake City under the direction of expert mechanics, learning the fine points of motor car construction. She laid on her back days and days delving into the mysteries of differentials, transmissions, clutches and other strange things that make the car go. She has been given repair work to do at the service station, and the mechanician declares she gets away with it fine.

Miss McCune expects to leave for France within the next few weeks. She wants to be close to the firing line and help drive the ambulances that carry wounded soldiers from the field hospitals to the larger base hospitals.

All the activities of women and motor cars in the war do not tend to mechanical work necessarily. For instance, Mrs. Blish Thompson of Seymour, Ind., has planned to avenge the death of her husband on the Lusitania through the motor car. The Thompson garage contained two cars, a four-cylinder racing roadster and a six-cylinder touring car. Mrs. Thompson had the roadster rebuilt at the National factory to conform with French military requirements and then sent the car to General Joffre. It is now being used as a scout car at the front. The other car, a touring model, will help save men, as it has been turned over to the Red Cross in France. Mrs. Thompson herself is an active Red Cross worker.



When Miss Nealey tinkers with a wheel she dresses the part

Help Save the Food

The Automobile Club of Rochester, N. Y., has organized a save-the-food movement the rest of the country well might follow. Many motorists have adopted this method informally, but it is systemized adoption that is needed, and this the Rochester club intends. The plan is in brief:

Large wooden signs, black with white letters, will be furnished to country members. On these signs will be chalked the farm material for sale, butter, eggs, chickens and other food. The sign will be displayed on a post in front of the farmer's residence and close enough to the road for the passing motorists to see.

Each sign issued by the club will have a number and a place for the member's name so that complaints can be traced. In this way, no advantage can be taken of the plan. The farmers of the community already have approved the plan. It lessens marketing costs for them and insures a ready sale for his produce.

The farmers need a plan such as this to sell such produce as garden truck. Every available acre is in crops, and the late season has forced the farmer to continue at his field work during the season when ordinarily he would be taking his small produce to market. Many vegetables and fruits will not be harvested or, if harvested, will not reach the city and town consumers. This plan will mean the sale of all farm truck, thus eliminating waste in this time when all waste is especially deplorable and at the same time helping the motorist do his part in the Nation's war efforts to conserve the food. Farm vegetables and fruits might be obtained in this way and put up by the city or town consumer much more economically and readily than the same produce could be obtained in the city market from the few farmers who have time and means to come to market.

There is a lot of small garden truck yet to come on the market. The motorist can follow this plan of buying all fall if he so wishes, especially in the regions of the Mississippi valley, where often late potatoes, beans, lettuce and any amount of other garden food is brought on.

Take your car out the country road. Fill your cellars for winter. The farmer will be ahead. You will be ahead. The Nation will be ahead. All our allies will be ahead. Waste makes waste. The less food conserved, the less food harvested—the less there is to send to the allies who cannot grow this food and the less there is for the men of our own great national army.

The Motor Car Repair Shop

Attention to Fuel Pipe Lessens Costs

A USEFUL feature frequently overlooked on cars is the gasoline sediment bulb located at the tank outlet usually. This sediment bulb is generally fitted with a wire gauze screen and cup to catch any foreign matter that might have found its way into the gasoline. This bulb should be periodically cleaned out, because nowadays when much of the filling is through rubber hose from underground tanks it is more than ever necessary to strain the fuel, as in time the hose deteriorates and particles of the rubber are apt to be carried into the tank. It is also a good idea to occasionally remove the gasoline pipe and run a piece of soft iron wire through it to dislodge any dirt or other foreign matter that may have become lodged in it. The reason that soft wire is used is because the latter will follow the bends in the pipe easily. Flush out the pipe with gasoline before putting it back.

In connection with the gasoline system it may not be amiss to mention the vacuum tank, if the car is so equipped. The best advice here is to leave the tank alone, for it is not likely that anything will ever get out of adjustment with it. Should there ever arise an occasion that the tank must be taken apart, the head, in the case of the Stewart, is removable by taking out the screws around the edge of the cover. There is a gasket placed between the headpiece and the body, and this must be carefully handled against damage, because in service there must be no air leakage at this point.

Filling Tank

If for any reason the tank becomes empty, usually it can be filled by turning the engine over a few times with the throttle closed. The suction of the engine will set up enough vacuum in the tank to draw in the fuel. There is a plug in the top of the tank and if turning over the engine does not draw in gasoline, then a little quantity poured in the plug hole will serve to wash away any dirt that may have prevented the operating valve from closing. It will also act to prime the device. This operation is rarely necessary, because of the inherent construction of the tank. It is only occasionally after the tank has remained inoperative for a long time that it might require such priming.

Some owners often wonder why their cars will consume more gasoline per mile after the car has been operated a year or more, than when new. A common cause of this is leakage in the gasoline line. Such a leak is hard to find inasmuch as the leakage is not at a rapid rate and hence the owner will let the condition continue. An occasional inspection of the unions in the gasoline line will do much towards decreasing the fuel bill. When the car is operated on an over-rich mixture for any length of time, it will show a rise in the fuel consumption.

Another source of trouble, which is directly responsible for increased fuel consumption is a slipping clutch. Owners should take it upon themselves to see that their cars are not suffering from this trouble, which is not hard to remedy. A slipping clutch allows the engine to speed up to a higher number of revolutions than that required to propel the car and hence more gasoline is burned.

Applying Tire Putty

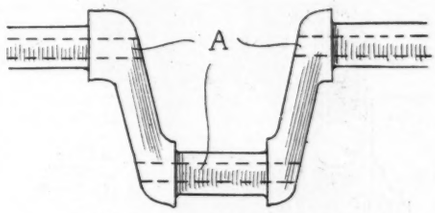
Motorists realize more and more that thousands of miles of tire life can be added and much money saved through preventing tire troubles by a few simple, prompt precautions. Tire saver kits supply those precautions. It is one thing to have a tire saver kit, and yet another to know how to use its contents properly. Motorists know, for instance, that the insertion of a little tire putty in small tread cuts closes such cuts up and prevents sand and water from getting to the tire fabric, where they ruin any tire in a comparatively short time.

Even so simple a thing as the application of tire putty to a tread or side wall cut must be done right, if the operation is to be successful. We often encounter cases where a motorist has found a small cut on the outside of his tire, has simply stopped long enough to put in some tire putty and has then gone his way. Later he has complained that the putty didn't stay. That was perfectly natural. There is a right and a wrong way to fill tread cuts. The right way is this: Select a time when the car will not be used for several hours, say in the evening when the car is to be laid up for the night. Then the cut should be washed with gasoline so that no dirt remains. Next the cut should have a coat of the cement that is inclosed in the tire saver kit. When the cement dries a second coating of cement should be applied and permitted to dry. Next, see that the hands are clean and dry, free from perspiration. Take a little tire putty, roll it between the fingers and then force it evenly and firmly into the cut. Let it set until morning.—The Goodyear Tire & Rubber Co., Akron, Ohio.

Roadside Repairs



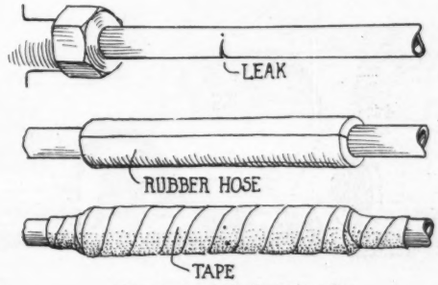
Vibration had caused the fuel line on a car to break about 3 in. from the tank connection. The leak was discovered by the driver when the car was stopped on the road, miles from any town or farm house where the pipe might be soldered or replaced. There were no bends or loops in the pipe to make it possible to shorten it so that the coupling might be made by cutting off the pipe at the leak. This is what was done. The gasoline was shut off at the tank and the pipe wiped dry and clean at the point of leakage. Then shellac was applied to the surface for a distance of 2 or 3 in. and allowed to become nearly dry. A piece of rubber tubing was then obtained by cutting off a few inches from the pump hose and cut lengthwise and slipped over the pipe covering up the leak. The whole was then given another coat of shellac and allowed to become set. To finish the job adhesive tape was wrapped around the pipe and rubber tube and then a final coat of shellac applied to the entire repair.



How reader drills crankshaft

Drilling Crankshafts

Editor MOTOR AGE—You might be interested to know how Ford crankshafts, or any other crankshaft for that matter, can be lightened to a considerable extent without weakening them. I have done this in several instances by drilling the crankshafts as shown in the accompanying illustration at A. The thing to watch out for is not to use too large a drill, as plenty of stock must be left at the bearings so that they will stand the shock of the explosion.—Richard Hautzenroeder, Mansfield, Ohio.



To repair fuel line break

The Readers' Clearing House

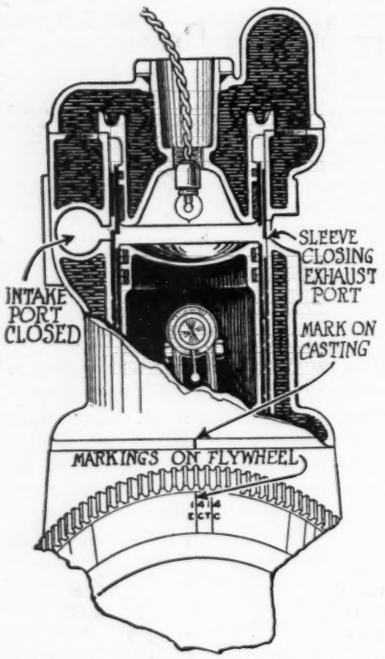


Fig. 1—Timing sleeves on Willys-Knight

Q—Explain the best method of timing the sliding sleeve valves. Give me the valve timing data of the Willys-Knight motor.—Alfred G. Colby, Arlington, S. D.

The opening and closing of the valves with respect to the position of the pistons is determined by the movement of the ports past the lower edge of the junk ring in the cylinder head. Taking up the cycle of operation on the intake or suction stroke in the No. 1 cylinder the action is as follows:

When the piston is on top center the intake port in the inner sleeve is in line with the port in the cylinder block. The port

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has inaugurated the segregation of inquiries into classes of allied nature. Questions pertaining to cooling will be answered under that head and so on.

This means that if you ask several questions in the same letter and they are on different phases of the motor car, these questions will be answered in different sections of the department. You can determine whether an answer appears by referring to the list of names published each week. If your name appears in the list, turn to the section on engines or whatever part of the car you have asked about. A miscellaneous section will take care of all unclassified questions, so do not overlook it if your name is not in a classified section but is in the list.

Concerning Engines

in the outer sleeve, however, just starts to uncover the opening in the cylinder block as the piston starts downward and as the 1-4 mark on the flywheel —— is in line with the 1-0 indicating mark on the end of the cylinder block. The two ports continue to register until the piston has reached and passed 1-4 its lower center, or until the mark —— 1-C registers with the punch mark on the cylinder block. At this instant the lower edge of the intake port in the inner sleeve passes under the lower edge of the junk ring in the cylinder head and closes the intake passage.

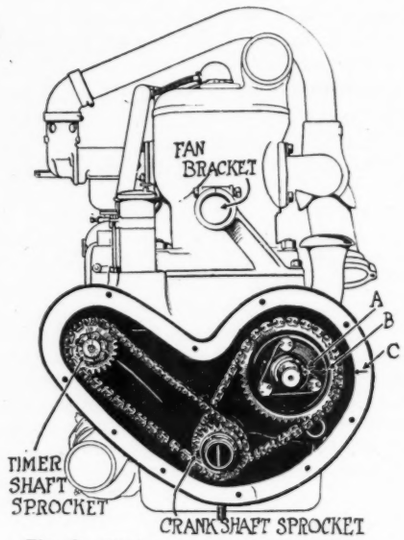


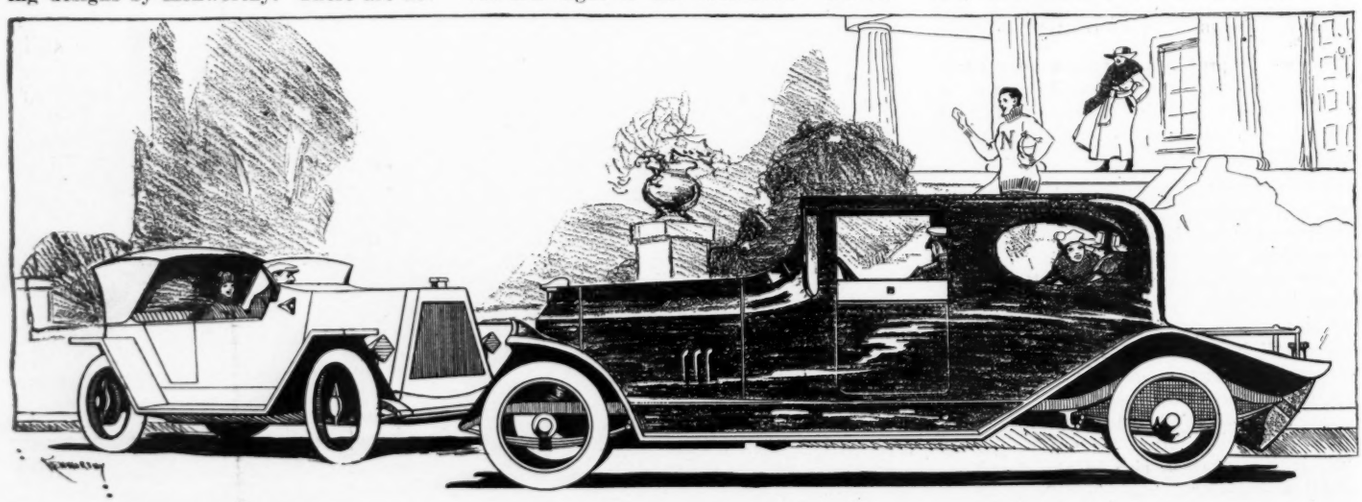
Fig. 2—Timing gears on Willys-Knight

The inner sleeve continues its upward travel through the compression or second stroke of the engine, until, when the piston reaches the top center it is highest in the point of its travel. At this instant the explosion occurs in the cylinder, the piston is driven down by this force and at the same time the inner sleeve starts to travel downward. As the piston reaches the bottom center, the exhaust port in the inner sleeve and the exhaust in the outer sleeve register with the opening in the cylinder block to the exhaust manifold and remain open until the piston has completed its upward stroke, so forcing the exhaust or burned gases into the exhaust pipe.

Thus it will be seen that the valve timing must be checked by determining the relative position of the sleeves and the

Some New Body Ideas of Unusual Type

Motor car enthusiasts who are on the alert for something heretofore never attempted in the way of body shapes, may find a suggestion or two in the accompanying designs by Kenworthy. These are not freaks, but embody constructional details in such a way that a good body-builder could put them into practice. A little feature of the car on the left is the placing of the side light in the ventilator. The inclosed car is fitted with a rear deck under which is carried the gasoline tank, the filler pipe extending upward into a convenient position. On top of the deck is a rail, which serves to hold a trunk.



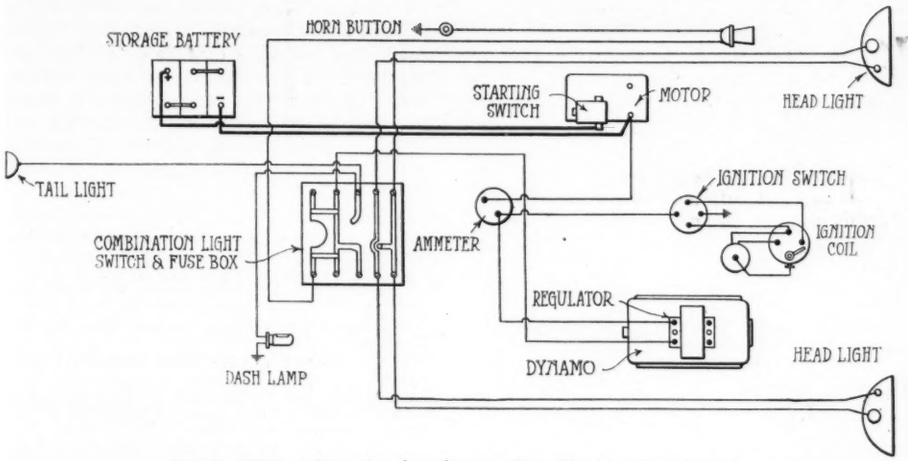


Fig. 3—Wiring diagram of system used on Fleetwood model Paige

ports in the cylinder block. As the sleeves are driven from a single eccentric shaft there is no possibility of their relative positions being disturbed.

To check the timing of the sleeves, remove the exhaust manifold to expose the exhaust ports in the cylinders and place a small electric trouble lamp through the spark plug hole. Then turn the engine over slowly until a narrow pencil of light is barely discernible between the upper edge of the port in the outer sleeve and the lower edge of the exhaust port in the cylinder block. At this position the exhaust port closes and the marks EC on the fly wheel should so indicate this action by registering with the guide marks on the cylinder block. This method of timing the valves need only be resorted to when a new eccentric shaft sprocket has been fitted.

To assemble the sprockets on the crankshaft and camshaft and replace the chain in the proper position turn the engine over until the mark $\frac{1\text{-}4}{T\text{-}C}$ registers with the mark on the cylinder block, then turn the eccentric shaft until the mark A is in line with the mark C on the edge of the chain housing. Now place the chain on the sprockets so that when it is drawn up tight the mark B on the eccentric shaft sprocket will be in line with the mark A on the hub and push the sprocket in place.

Q.—Would it increase the power of a 1911 Cadillac engine to install a set of lighter pistons?—Charles L. Hetherington, Bentleyville, Pa.

You would probably not gain very much by installing lighter pistons, inasmuch as the engine is rather old design and lighter pistons in themselves do not always give an engine more snap. It means that other reciprocating parts like the connecting rods must also be lightened. If you do install a set of lighter pistons see that the clearance is correct. For instance, the clearance for an aluminum alloy piston should be about .005 more per inch of bore than for cast iron. In other words, with a 4-in. cylinder with pressure clearance of .001 bottom and .002 top, add .002 to the bottom, making it .003, and .002 to the top, making it .004 in. With steel pistons you can add .001 clearance to that now used for cast iron pistons. With sueh clearances a heavier oil should be used and in many of the racing cars drivers use castor oil or a mixture of castor and some heavy oil. You will also find that at low speeds and when starting up, there will be some piston slap, especially if the oil is light.

Q.—There is no motor number on the cylinder head of my Ford car. Where can I get this number?—E. S. R. S., Chicago, Ill.

There is no number on the cylinder head of the Ford engine. The makers' stamp is on the cylinder block casting near the water inlet connection. If the car is a second-hand machine, it may be possible that the previous owner has removed the number by filing it or using emery paper. If you find no number here, we do not see how you can get the original number, unless you write to the maker stating the car number. The maker might then be able to tell you what the number of the engine was that was fitted to this car in the factory.

Wiring Problems

Q.—Show a wiring diagram of a Michigan car, 40, and mark on diagram where to connect an ammeter.—L. S. Strawn, Damascus, Ohio.

This wiring diagram is shown in Fig. 4.

Q.—Publish wiring diagram for Fleetwood model Paige.—C. A. Colville, Kayenta, Ariz.

This is shown in Fig. 3.

Q.—Publish a sketch showing how an ammeter is attached on an Oakland Model 32.—Chas. H. Rousek, Burwell, Nebr.

This diagram is shown in Fig. 5.

Q.—Can a Ford magneto be tested with dry cells without injuring or changing the polarities in the magnets?—Alfred G. Colby, Arlington, S. D.

Yes. All that is necessary is to connect up a set of cells in series and then run one of the wires to the binding post or terminals on the dash marked bat. The other end is then grounded. Now run the car at a speed of about 10 m.p.h. on the dry cells and then switch over to the magneto. If there is a tendency for the engine to miss or the explosions seem weak when in comparison to those when running on the batteries, it is likely that the magneto magnets are weak or there might be a grounded

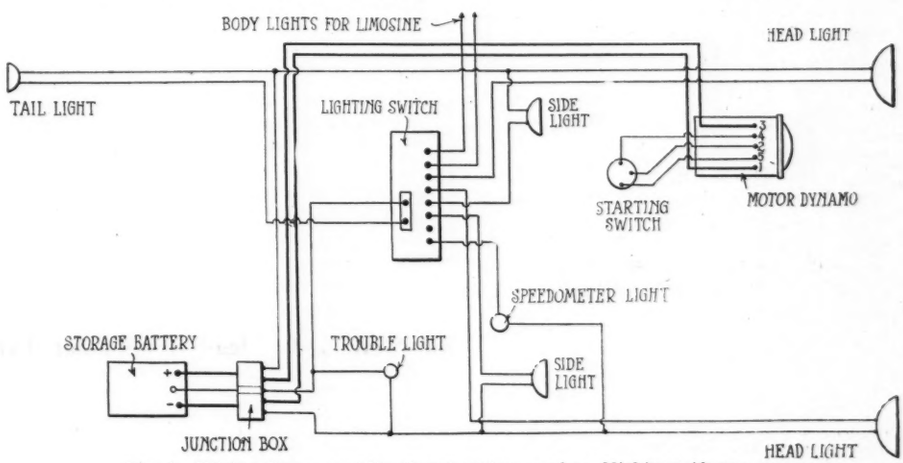


Fig. 4—Wiring diagram of Northeast system used on Michigan 40 car

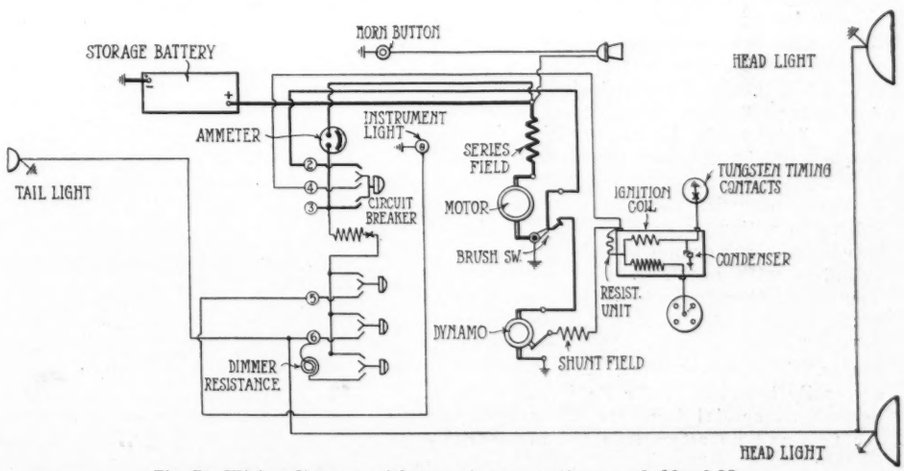


Fig. 5—Wiring diagram with ammeter connections on Oakland 32

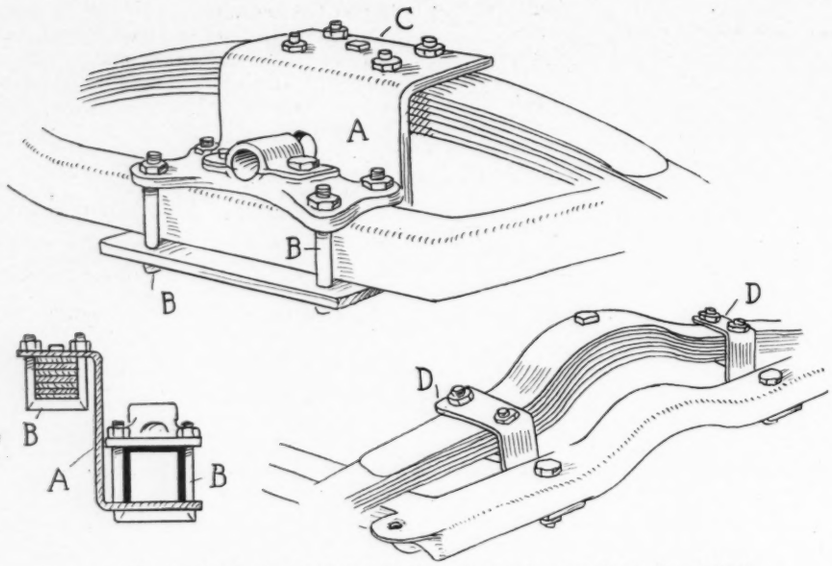


Fig. 6—Suggestion for lowering Ford frame, inexpensive and practical

coil or coils. To test for the latter, connect four dry cells in series with a small 6-volt light and attach one of the terminals to the magneto plug terminal point. To make this test requires that the magnet, or at least the transmission cover be removed from the engine. Touch each coil with the loose end of the wire coming from the light beginning with the top coil and taking them alternately, that is, take every other one. If the lamp lights, it shows that the circuit is clear up to that point. Touch the wire to the iron frame of the magneto and if the lamp lights it shows there is a ground somewhere. If one of the wires touches a coil and the other is placed at any point on the frame of the magneto and the lamp lights, shake each coil to test for the ground. If everything is well, the lamp should not light when the wires are in the above position. It sometimes happens that the coils get loose and when the engine runs the vibration will cause the coil to short on the magneto frame. That is the reason why in making this test you should shake the coils to see if any is loose.

Q.—Would you recommend a Bosch magneto on a Ford speedster and have the regular magneto take care of the lighting?—E. S. R. S., Chicago.

If you want high speeds, it would be advisable for you to install a different form of ignition system than the present Ford type. The objection to the latter is that it is a low-tension form of instrument producing from 6 to 18 volts, alternating current. This would be all right if some means could be provided for quickly transforming this current into a high-tension current. But with the ordinary vibrating coils, the action is so slow that at high speeds the spark cannot be delivered to the cylinders with any degree of regularity. You would therefore get better results by fitting either a high-tension magneto or one of the battery systems which uses no vibrator. The latter types of instruments are easily attached to the Ford engine, inasmuch as special brackets are provided for this and no alterations are necessary in the design of the engine. This is also true of some of the magnetos, which come with a special form of gear-drive mechanism. The battery systems are not so expensive as the high tension magnetos and as they require very little effort to drive them, we should advise this system for your car.

Rebuilding

Q.—Give an illustration showing how the steering wheel can be lowered on a 1911 Cadillac.—Charles L. Hetherington, Bentleyville, Pa.

An arrangement for lowering the steering wheel on this car is shown in Fig. 8. You will note that both the bracket on the frame of the car as well as the one on the dash are set at a different angle and wedge-shaped pieces of wood are placed under the brackets so that the whole job can be clamped tight by bolts. The wood pieces simply take up the space caused by tipping the brackets. The first thing to do is to loosen the entire steering gear from the frame and dash and then set it at the angle you want, holding it in place by braces or clamps. Then mark the positions of the holes that you will have to drill in the frame for the bolts that hold the brackets in place. When these have been spotted and drilled the gear can be bolted in place. You may have to do a little cutting and fitting here and there, but the illustration will give you a general scheme to follow.

Q.—I am about to build a Ford racer and would like the following information:

1—Where could I get gears for a 3 to 1 ratios and would I need a different rear axle housing for the gears?

2—Where could I get the material for underslinging?

3—Would you advise wire wheels or Ford wheels?

4—Where can I get a set of aluminite pistons fitted with Burd high compression rings? Do you advise their use?

5—Could the Ford ignition system be depended upon?—W. S. Cook, Sethbridge, Alberta, Canada.

1—You can obtain these gears from most any of the large supply houses like Beckley-Ralston Co., Chicago. You might also write to the Nicols, Dean & Gregg Co., St. Paul, Minn., which concern we believe can furnish you with them.

It will not be necessary for you to get a new housing and the new gears will be interchangeable with the old ones. One point must be remembered, however, when you come to assemble the rear axle unit after the ring gear has been put in and the pinion is on the drive shaft. Do not bring the two axle housings close together and bolt them with the seven bolts provided for the purpose until the drive shaft tube has been partially set into the recess on the bell housings. All three parts that is, the two axle housings and end of drive shaft, must be adjusted at the same time. The reason is this. The hole in the axle housings through which the ordinary Ford pinion is capable of entering, is not large enough for the new pinion, which is larger in diameter than the other. Also when connecting up the axle units see that the thrust washers do not slip off the retaining pins, as this will prevent the two axle housings from coming together properly.

2—So far as we know there are no special

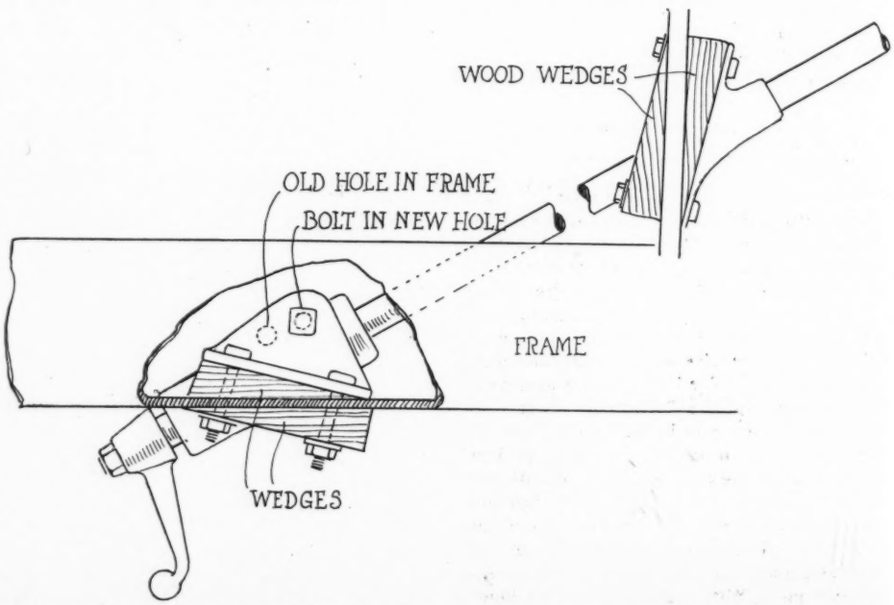


Fig. 7—Suggestion for lowering steering wheel on Ford car

brackets, etc., made for underslinging the Ford frame and you would probably have to have these made to order. If you have access to a blacksmith or machine shop, why not make them yourself? In Fig. 6 is shown a method of lowering the Ford frame in answer to an inquiry from a reader.

3—Either set of wheels will do, but the preference among racing men is for the wire wheels.

4—The advertising columns of MOTOR AGE list concerns that make a specialty of this kind of work.

5—The Ford magneto is not so well adapted for extreme high speed as some of the battery systems using an elevated distributer, or any of the standard forms of high-tension magnetos.

Q.—Is the rocker steering arm on a Ford car strong enough to tour over rough roads, say at about 20 m.p.h.?
2—Are wire wheels strong enough for long trips?
3—How can the steering wheel on a Ford be lowered?—E. S. R. S., Chicago, Ill.

1—We have as yet to see a Ford car on which the steering arm was broken from ordinary use over give and take roads. It may not be quite so comfortable to steer a car with this kind of steering over rough roads, but so far as breakage is concerned we think that you then will have little to fear.

2—There is no reason why wire wheels should not be strong enough for long trips, in fact, many of the transcontinental tourists and coast-to-coast record breakers have their motor cars equipped with wire wheels.

3—In Fig. 7 is shown a method of lowering the Ford steering wheel. All you have to do is to remove the frame bracket and that holding the steering gear in place on the dash. Then cut some wedge shaped pieces of wood and after you have tilted the steering column at the angle desired, fit the wedges in place and bolt on the brackets again. Obviously you cannot use the same holes in the frame and dash, so new ones must be drilled after the centers have been spotted properly. It will also be necessary to get longer bolts to take up the thickness of the wood pieces. All of the wood pieces are made with the same taper, so that if you have cut one correctly, you can use it as a pattern then for all of the others.

Q.—Give a good method of lowering the frame of a Ford chassis which is inexpensive and practical.—G. A. Stahl, Blakesburg, Iowa.

In Fig. 6 is shown a suggestion for lowering the Ford frame. It consists of making three goosenecks as shown by A in the front of the car and D, the ones that carry the frame on the rear spring. The pieces A and D will have to be heated before they are bent to the shape shown. Holes are then drilled in them to accommodate the various shanks of the clips B. Piece A is provided with a hole also in the vertical part for the crank to come through. This construction places the front spring ahead of the front cross member of the frame and hence makes it necessary to use longer radius rods. At the rear, the goosenecks are placed so that the rear spring will come ahead of the rear cross member of the frame. The distance the front spring is ahead of the frame will correspond with the distance from the rear spring to rear cross member.

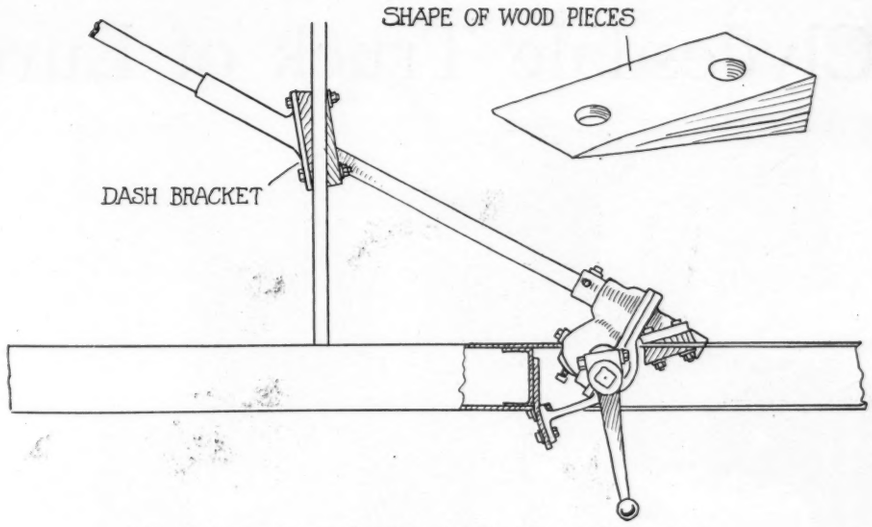


Fig. 8—Suggestion for lowering steering wheel on Cadillac car

Communications Received and Inquiries Answered

L. S. Strawn	Damascus, Ohio
C. A. Colville	Rayenta, Ariz.
C. H. Rousek	Burwell, Neb.
T. W. H.	Elgin, Ill.
C. L. Hetherington	Bentleyville, Pa.
A. G. Colby	Arlington, S. D.
F. G. McFay	Joplin, Mo.
W. S. Cook	Sethbridge, Can.
G. A. Stahl	Blakesburg, Iowa
E. O. Skogerson	Northfield, Minn.
E. S. R. S.	Chicago

Manufacturers' Communications

MILWAUKEE, Wis.—Editor MOTOR AGE—In a recent issue of MOTOR AGE you published a communication from a gentleman from Kansas, who advises your readers that if they want to prevent the glare from their headlights by covering or frosting their headlight fronts, to cover the lower instead of the upper half of the lens. Your correspondent evidently does not understand either the importance or the effect of focusing his lamps in his headlights.

If the lamps are placed so that the incandescent filament is back of the focal point of the reflector the rays will spread out from the headlight and in that case the proper procedure is to cover or frost the top half of the glass. But if the filament is placed ahead of the focal point the rays will first cross and then spread—making a beam with something of the shape of an hour glass—and in that case your correspondent is right and the lower half of the lenses is the one to be covered.

As a matter of fact his scheme is a pretty poor makeshift anyhow. The problem of preventing glaring headlights is not so easily solved as all that. An absolutely perfect and automatically foolproof device for preventing headlight glare has never been invented; at least if it has the inventor has failed to put it on the market—though there are a number of devices that succeed in preventing glare if they are properly adjusted.

The main trouble with most of these devices is that, while they do succeed in stopping the glare, they also cut down or cut out part of the light that should go on to the road. The main reason for putting headlights on motor cars is so that the road can be properly lighted at night. If the headlight fails to do this it fails to accomplish its main purpose, even though it may never glare in the least.—H. T. Ferguson.

Miscellaneous

Q.—Would the oiling system for a Ford published in the issue of June 7, 1917, be impracticable for use on a Ford touring car?
2—Give the name of a firm making a device such as this ready for installing.—F. G. McFay, Joplin, Mo.

1—There is no reason why the oiling system suggested in that article should not be adaptable to a Ford car used for touring purposes, but there is no real necessity for it. The regular Ford system of oiling at touring speeds is fully capable of taking care of the engine lubrication. The reason why the oil pump driven off the camshaft was suggested for those who rebuilt their Ford cars into speedsters or racing cars is because at high speeds the Ford oiling system is not adequate. This is so for this reason: Owing to vibration of the engine the oil does not always find its way back to the timing gears through the oil pipe on the inside of the crankcase. It is impossible for enough oil to be caught in the pipe and hence some positive means such as the pump, must be provided to carry the oil back to the timing gears. While the system would be all right to use on the stock cars, there is no necessity for it.

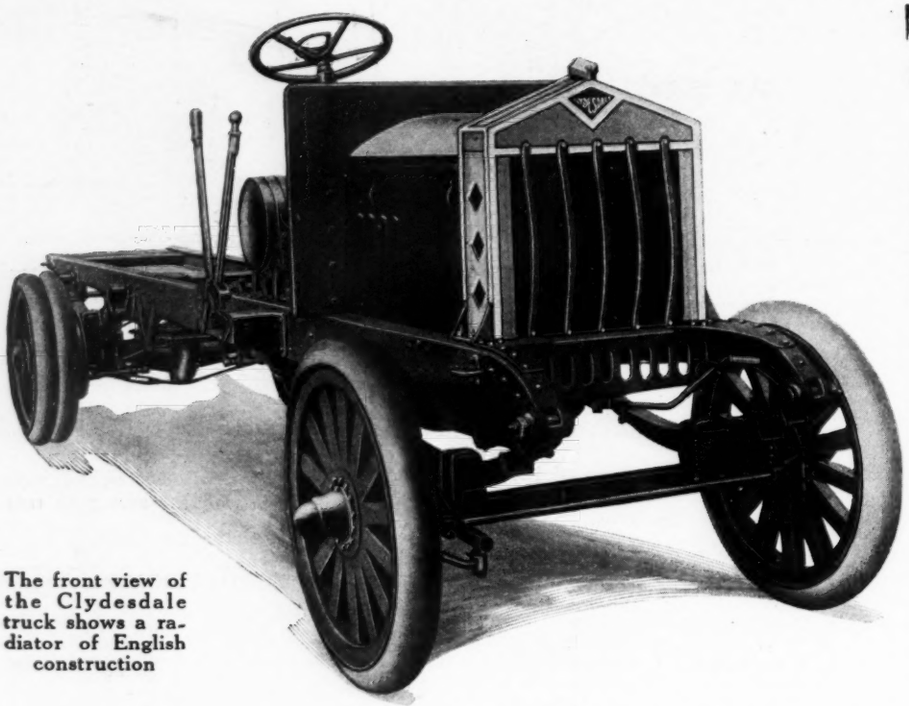
2—There is no concern that we know of that makes a system like this for the Ford car. It was distinctly a MOTOR AGE suggestion.

Flat Tire Damages Rim

Q.—What harm is likely to be to a tire that is applied to a rim that has been run without a tire on it for a while? Also can I use straight side tires on a clincher rim?—T. W. H., Elgin, Ill.

Whenever a car is run on the road without a tire on one or more of the rims, much damage is done to the latter on account of stones and other obstructions which dent the beads of the rim. The same is true when running with a flat tire. The rim then generally has the appearance as though it had been pounded with a hammer at different points around the circumference. Naturally if an attempt is made to fit a new tire to such a rim it will not seat properly at the points where the dents occur. The result is that the tire is severely cut at these points and will not last as long as it would otherwise.

Clydesdale Truck of European Design



The front view of the Clydesdale truck shows a radiator of English construction

AT the beginning of the European war when the French and English governments required a large number of trucks for army transport purposes, engineers of the Clyde Cars Co. in consultation with European engineers who were in America at that time designed the Clydesdale commercial chassis to suit the rigorous requirements of European conditions. The present development is a European-designed, American-built truck, embodying the ideas of European engineers in arrangement and co-ordination of the various units, and also in the use of high grade materials and careful design.

How Chassis Differ

Some of the differences between the Clydesdale chassis and the usual American design follow:

Construction of the radiator is patterned after that used by the London General Omnibus. This is equipped with straight copper tubes without fins, the tubes being sweated into header plates, and the header plates bolted to the top and bottom of aluminum cast tanks. These tubes are standard size and if any tubes spring a leak, it is a simple matter to cut out the tube giving trouble and stop up the opening or turn the tube over and close it so that the radiator remains efficient. The radiator core is protected by five bars.

Another feature of the Clydesdale equipment is the controller, which not only governs the speed but enables the driver to maintain a constant speed without the necessity of keeping the foot on the accelerator. This governor throttle mechanism can be set at 10 m.p.h. and the truck will continue at that speed up and down hills regardless of road conditions, without further attention of the driver. However, it does not prevent the driver from using the accelerator for a spurt any time he cares to. If the clutch is suddenly thrown out, the controller cuts down the throttle opening, thereby reducing the engine speed.

The frame is stronger than usual American practice. The gearset is a four-speed separate unit centrally located, which reduces the length of the rear propeller shaft and in consequence the strain on the drive shaft universal. Final drive is by worm gear.

The radiator is mounted on double compensating springs, one set above and one below the frame with a bolt running through and allowing the radiator to ride freely on these double supports. The hood is supported at the front by steel construction and does not touch the radiator at all. The engine is a four-cylinder L-head with a three-bearing crankshaft.

These trucks are built in five sizes ranging from a ¾-ton delivery model up to 5-ton. The company has been running on government orders but has recently enlarged its plant to allow for the sale of trucks in this country.

Westcott Cars for 1918 Show Latest Body Lines

PRACTICALLY no mechanical changes differentiate the Series 18 of the Westcott Motor Car Co. at Springfield, Ohio, from Series 17. The body lines have been changed to conform with the latest in body work, but only a few details, among them cup lubrication instead of grease cups, mark the chassis.

The Westcott car is an assembled car which utilizes standard parts. The engine is a Continental, the gearset a Brown-Lipe, the axles Timken, and the steering gear Gommer. A unit powerplant of three-point suspension, with the drive taken through cantilever springs and the rear axle torque absorbed by a torsion tube are other features. The 1918 cars have a built-in tool compartment in place of the former equipment, and a storm-proof windshield and a self-acting top have been added.

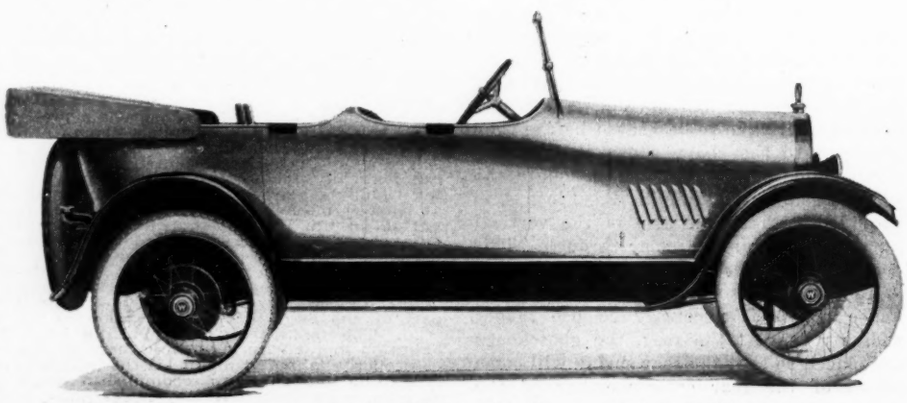
The Continental engine used is the standard 3½ in. by 5¼ in. six-cylinder, with the cylinders cast in block and the valves on the right side. This is model 7 N with an S. A. E. rating of 29.4 developing on the brake 50 hp. at 1900 r.p.m. Lubrication is by combination pressure feed-and-splash system, the oil being forced to the main and cam bearings and splashed to the rods and pistons. The crankcase is aluminum and the oil pan is pressed steel, the bearings being carried in the aluminum crankcase and accessible by removing the oil pan.

Drop-Forged Camshaft

The valves are operated by a drop-forged camshaft running in white bronze bearings, which operate against pushrods of mushroom type. The timing gears are cut helically, and the valve action itself is inclosed by removable cover plates. The inlet and exhaust valves are interchangeable and have nickel steel heads electrically welded to carbon steel stems.

The exhaust manifold is separate and is clamped to the cylinder. A hot-air stove is cast on each exhaust manifold, so that the carbureter is provided with all hot air. The carbureter is a model M 3 Rayfield, 1½ in. in size. It is the side-outlet type.

A single-ignition system is employed,



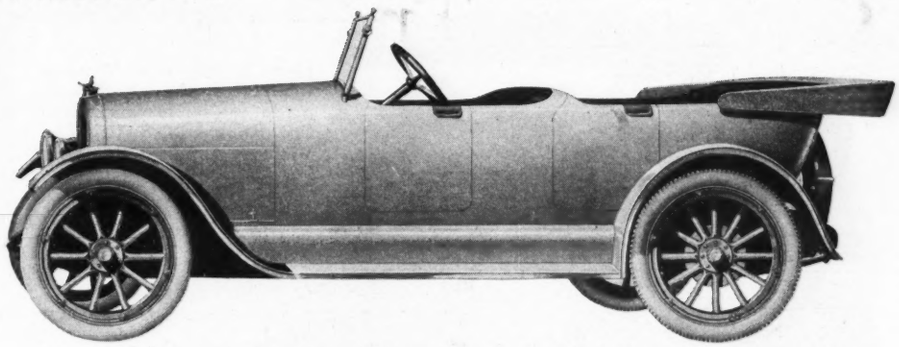
The seven-passenger on the 125-in. wheelbase used by all Westcotts

this and the generator as well as the starting motor being of Delco manufacture, with the grounded-return system of wiring. The battery is a 120 amp.hr. Willard.

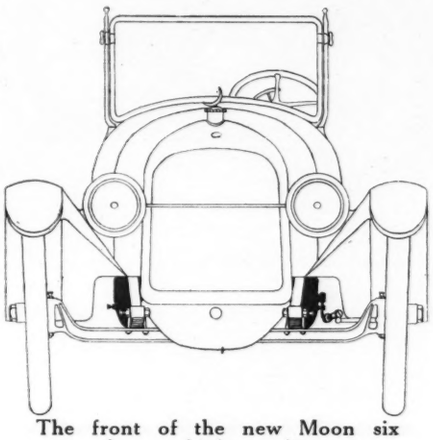
The power is taken from the engine by a dry multiple-disk clutch and a three-speed Brown-Lipe gearset, from which it is led to a spiral bevel Timken three-quarter floating rear axle, having a ratio of 4.9 to 1. The wheels are 34 in. in diameter and are equipped with 35 by 4½ in. oversized Firestone tires. The wheels are wood.

Both sets of brakes are bolted to the rear wheels, the foot brake having a drum diameter of 14 in. and a face width of 2 in., while the hand brake, which is the internal, has a face width of 2 in.

The equipment includes a Warner speedometer, five Firestone demountable rims, a four bow automatic top, made by the Ashtabula Bow Socket Co., a Warner clock, jiffy curtains with the Blackmore door feature, Stewart tire pump and a Troy windshield. The car is made up in five body types: A seven-passenger touring, five-passenger touring and a four-passenger roadster, all selling for $1,790; a convertible seven-passenger sedan, $2,390, and a convertible five-passenger sedan selling for $2,390. Any of these cars can be furnished in gray or blue. They are all mounted on a 125-in. wheelbase and upholstered in dull finish long grain leather in the case of the touring and roadster and in a choice of cloth in the case of the convertible sedans.



The latest Moon supplies a popular-priced, medium-weight car for the territory naturally reached by the Moon factory



The front of the new Moon six shows a higher radiator

New Moon Six Model at a Popular Price

IN announcing the new 6-36 model for the 1918 season the Moon Motor Car Co., St. Louis, Mo., has made a radical departure from its heretofore conservative line. Formerly the concern saw fit to make only a high-priced car that found its market in only the larger cities. The location of the Moon factory, its geographic position, which puts it at the gateway of the large popular-priced car-buying states like Iowa, Nebraska, Kansas, etc., had much to do with the development of the new model and consequent change in policy of this company. Realizing its strategic position, the company set out to design a popular-priced medium weight car that would fulfill the requirements of the adjacent states and the net sum of its efforts is the new Moon 6-36. There is nothing radical about the new model, for accepted Moon practice is used in all of the units—on a smaller scale. It was intended that the 6-36 should retain all of the characteristics of the former Moon models, so far as looks are concerned, the only real difference being that it has a perfectly straight line slope from the radiator to the dash. Last year's models had a slight break in this line at the juncture of the body and hood. The new car is simply an incorporation of Moon design and construction on a smaller scale. The car will be sold for $1,095 f.o.b. St. Louis, in both the touring and roadster types. Production started Sept. 1 and at a later date the company will announce the prices of the same chassis equipped with inclosed types of bodies. The wheelbase is 114 in.

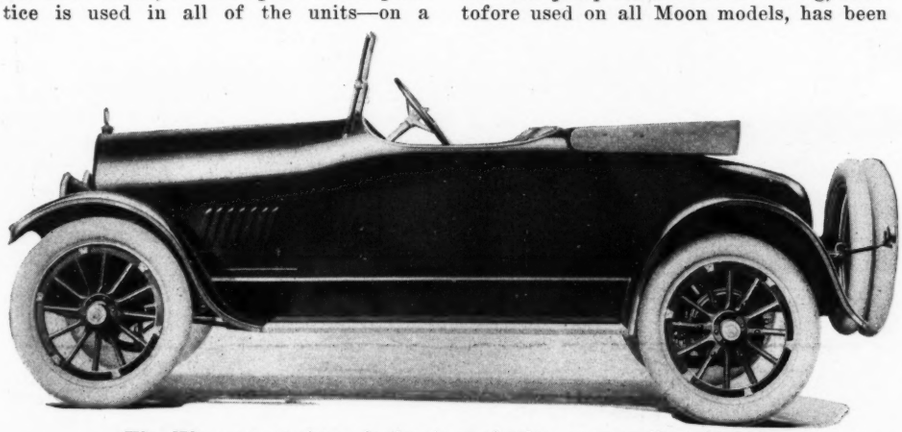
Inspection of the powerplant of the 6-36 reveals a Continental Red-Seal engine having a bore and stroke of 2⅞ in. and 4½ in. respectively. The six cylinders are cast in unit and pump circulation of cooling, heretofore used on all Moon models, has been replaced on this particular model by the thermo-syphon system. This has necessitated a slightly higher radiator to present more cooling surface, although the core is only 2½ in. deep. Ignition is taken care of by the Delco system, while the carbureter is a Tillotson, double-jet instrument. Gasoline is fed by gravity to the carbureter from a 12-gal. steel tank placed in the cowl. Oiling is by force-feed and splash, with pressure gage on the instrument board. The S. A. E. rating of this engine is 19.84 hp. Gasoline tests of this car have shown 20 miles and better to the gallon. The starting unit as well as the lighting system is the Wagner, two-unit, 6-volt system, using the Bendix drive on starter.

Three Speeds Forward

From the engine the drive is taken through a dry-plate multiple disk clutch of conventional design and then to the transmission on the rear axle. The transmission provides for three speeds forward and one reverse. The rear axle is equipped with Timken roller bearings throughout and the drive is taken by bevel gears, spirally cut. The rear axle is semi-floating and the drive which on other Moon models has been through the Hotchkiss form of construction, has been replaced by a long third member terminating in a yoke at the forward end of the drive shaft. Plenty of braking surface has been provided by fitting both sets of brakes on drums 12 in. in diameter and 2 in. face. The rear axle housing is pressed steel.

So far as control is concerned, standard practice is followed. Clutch and brake pedals are conventionally located, together with the foot throttle. There is also a hand throttle lever on the steering wheel in connection with the spark lever. The gearshift and brake levers are set in the center of the car, the former being placed ahead of the brake. The steering gear is on the left and is of the worm and gear type. The wheel itself is 17 in. in diameter and fitted with a corrugated rim.

The front axle is of I-beam construction and fitted with Timken roller bearings. Wheels are of the wood artillery type and carry tires 32 by 3½ in. Wire wheels will be furnished at an extra price. The frame is of pressed steel, channel-section and measures 4½ in. deep. It is made of 5/32 in. stock and has a decided kick-up over the rear axle. The latter makes possible the use of a low-hung frame and consequent relative flat rear spring, which insures comfortable spring action. The rear



The Westcott roadster, built of standard parts to sell at $1,790



Here is the new Victoria model of the Anderson, made by Anderson Motor Co., Rock Hill, S. C. The Victoria top comes extra for $150 but includes the touring top

springs are 50 in. long and 2 in. wide. Simplicity of construction and interchangeability have been secured by designing the springs so that both front and rear take the same sized hangers or links and shackle bolts. The rear spring has seven leaves. All of the spring eyes are bushed to take a hardened bolt which is fitted with a special oil cup.

The body is streamline and fitted with a slanting windshield. It also has both the front and rear cowl and in the former is placed a solid walnut instrument board. The floor of the body is so placed that it rests flush with the sills and thus lowers the entire seating arrangement. This, with the low position of the frame of the car, places the center of gravity where the riding comfort should be at its maximum, it is claimed. The tonneau is very roomy and fitted with wide doors having concealed hinges. Both front doors open wide so that the driver can enter from either side. The company states that the color will be optional, providing in all about five different color schemes.

Equipment will include electric headlights, with dimmers, and electric tail lamp all operated from a gang switch on the instrument board. On the latter is also an ammeter for the starting electric system. All of the electric wiring is inclosed in steel conduits. On the rear is placed a demountable rim and carrier, the latter being fitted with a thief-proof device. In addition there is the usual quota of tools, jack, pump, tire repair outfit, etc., equipment.

TWO 1918 GLIDE MODELS

Peoria, Ill., Sept. 1.—Two Glide models, using the same chassis, will be produced by the Bartholomew Co. in 1918. They will be a five-passenger touring and a four-passenger roadster, both to sell at $1,395 fully equipped. A detachable sedan top will be furnished at $200 extra.

The most important change in the Glide design is a lowering of the chassis by 1½ in. This produces a different drop in the front axle and a new design of pressed steel frame. The object in lowering the frame was to improve the appearance of the car, and this has been accomplished, it is stated, without reducing materially the road clearance.

All but sedan models now are equipped with slanting windshields and Motometers. Improvements have been made in the tops and curtains of the open types, the curtains being of Jiffy style. The windshield is straight on sedan models, this being necessary to insure proper fit to the sedan top. All touring models are painted in meteor blue, with black hood, fenders and gear and ivory white wheels. The roadsters are painted the same color, but an option is given on maroon bodies.

The chassis is equipped with a six-cylinder 3⅛ by 5 block engine developing 40 hp. at 2000 r.p.m. Other equipment includes a Rayfield carbureter, Stewart vacuum fuel feed from a 16-gal. tank, Westinghouse starting, lighting and ignition system and a circulating-splash lubricating system, a 2-gal. supply of oil being carried in the reservoir at the bottom of the crankshaft. The cooling water is circulated by centrifugal pump, and a two-blade, air-propeller type of fan is back of the radiator.

The clutch is a dry disk and the transmission a three-speed selective type combined with the engine. The drive to the rear axle is a propeller shaft with Spicer universal joints at both ends, and by helical bevel gears with a ratio of 4.64 to 1. The Hotchkiss drive is used. The wheelbase is 119 in. and the wheels are twelve-spoke wood artillery equipped with 34 by 4 Goodyear tires, rear non-skid. The body is of all-metal construction and incorporates such features as large doors with concealed hinges, long-grain enameled upholstery and high-class appointments.

HARVEY COMBINATION TRUCK

Judicious and rapid transportation of troops has been made possible by the combination army transport truck recently introduced by the Harvey Motor Truck Co., Harvey, Ill. This truck can be equally well adapted for freight transportation,

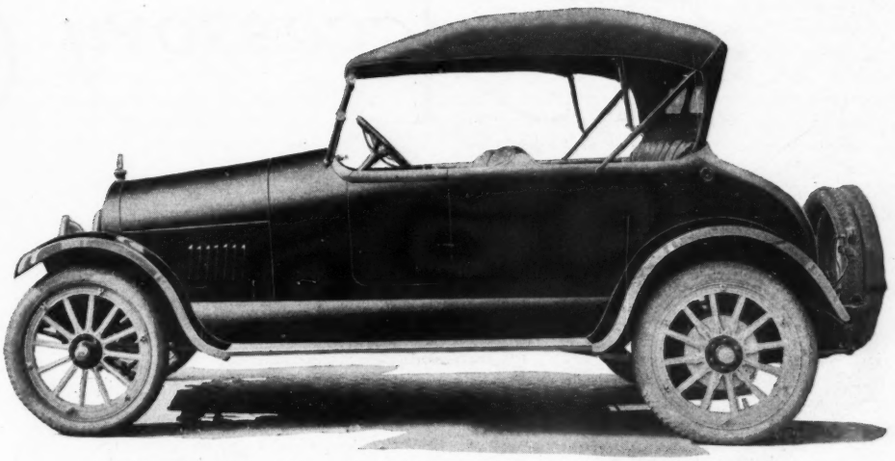


The Harvey army transport truck which adapts itself to carrying freight also

for which it has a capacity of 2½ tons. It is equipped with a body only 5 ft. wide and 12 ft. long and carries conveniently thirty-two men as the minimum load, but in all, it is possible to accommodate thirty-eight men when necessary. There are three rows of seats placed longitudinally and the men sit astride of them as on a horse.

By this method of seating it requires less room per man and utilizes every available inch of space. The seats can be dropped in 3 min., thereby giving a flat platform or a stake body for movement of freight.

The chassis on which this particular type of body is mounted is a standard model of the Harvey and is in line with the army truck specifications that the War Department issued in April. The truck has a four-speed transmission placed amidships, worm driven rear axle and dry-plate disk clutch.



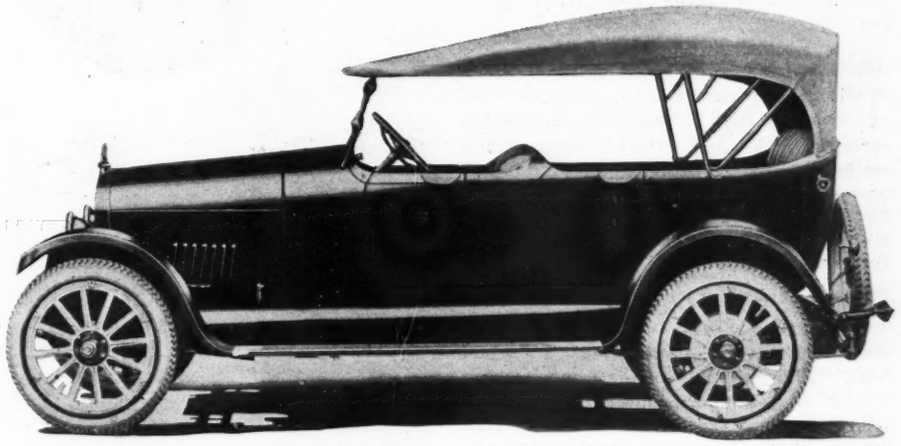
Five-passenger Jones six touring roadster, which sells at $1,675

Refinements Mark Jones Six for 1918

EXCEPT for improvements in refinement, the Jones six made by the Jones Motor Car Co., Wichita, Kans., is unchanged. Following its policy set a year ago, the company is making one style of chassis to which the various types of bodies are fitted.

The Jones body lines for 1918 have undergone no particular change, and there is a choice of four styles, ranging from a seven-passenger touring model at $1,675 to a touring sedan at $2,550. The other two models are a Victoria at $1,775 and a five-passenger roadster at $1,675.

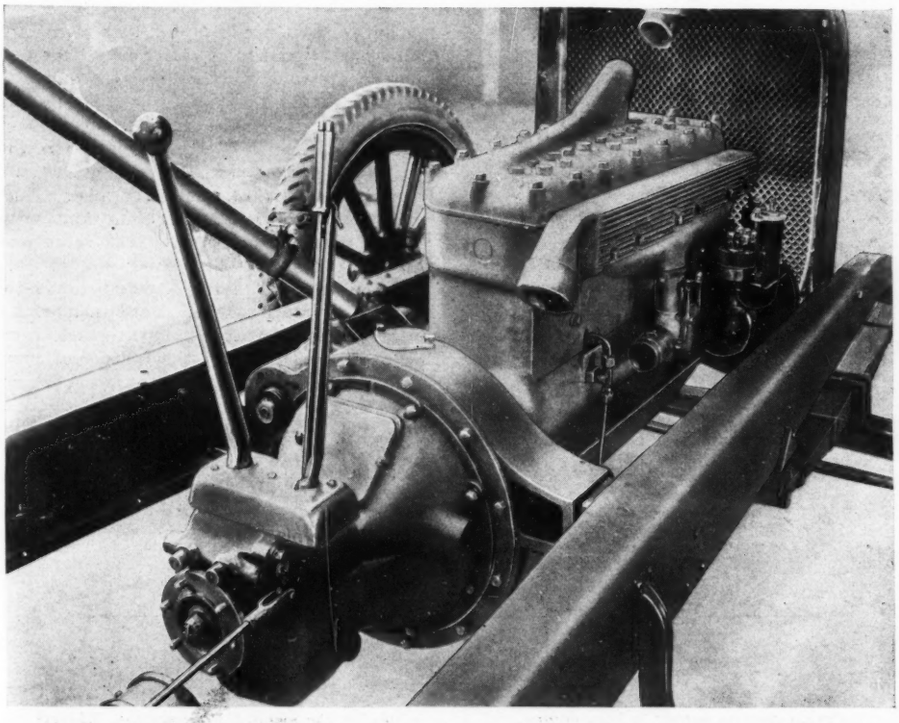
The front seats of the roadster are divided by a wide aisleway, while the upholstery is black enamel, machine buffed leather.



The seven-passenger Jones six touring model, also priced at $1,675

The engine is a Lewis block cast 3½ by 5⅛ with the crankcase and cylinder block cast integral. A remarkably clean appearance is presented by the engine. The crankcase is balanced inherently and is 2 in. in diameter. The connecting rods and reciprocating parts are made light with a view to reducing vibration. The engine has a removable cylinder head with cored water passages on the valve side of the head, as well as on the opposite side. The flywheel housing at the rear of the engine is bolted to the crankcase, and provision for alignment is made by dowel pins.

A combination force feed and splash system of lubrication, operated by a pump driven from an eccentric is used. Cooling is thermo-syphon. Two-unit starting and lighting with Remy distributor is used, the starting motor being geared to the flywheel by Bendix drive. The clutch is a Borg & Beck dry-plate. The rear axle is a Timken oversize, and a spiral bevel differential. Drive is Hotchkiss. This 34 by 4 straight side non-skid front and rear fitted to Firestone demountable rims are used on all models. The wheelbase is 125 in. All cars are finished in blue, but special colors may be secured when three weeks' notice is given.

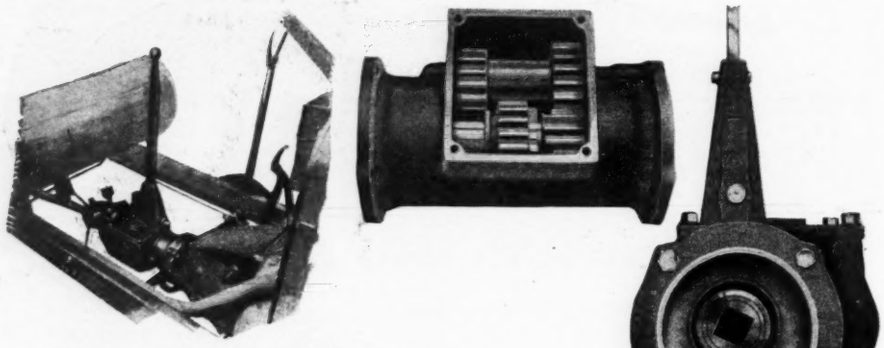


Chassis, showing clean appearance of engine used in Jones six models

LEXINGTON TO ADD MODEL

Connersville, Ind., Aug. 31.—Though few details are as yet obtainable, a new Minute-Man-Six model is expected from the Lexington company soon. It will have a wheelbase of 122 in., which is 6 in. longer than the present model. The tire will be 34 by 4 instead of 32 by 4, and the frame will be decidedly new, its feature being the elimination of more than 100 parts.

The Accessory Corner



Woodward front-end transmission for Ford cars in detail

Champion Shock Absorber

THE Champion shock absorber for Ford cars consists of twin coil compression springs of the best crucible steel, heavy malleable castings designed for durability, grease cups and S. A. E. bolt equipment. Four shock absorbers make complete equipment. Champion Shock Absorber Sales Co., Indianapolis, Ind.

Presto Electric Heater

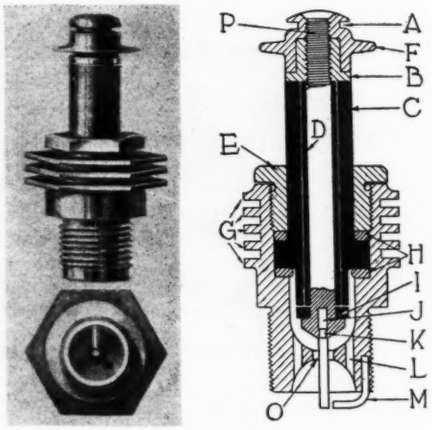
The Presto heater operates from the electric light socket and has a swivel base, allowing it to be hung practically any place under the hood. All that is necessary is to place the heater under the hood, close to the engine, carbureter or radiator. The device is 11½ in. long, 3¼ in. wide and 1½ in. thick. It comes complete with 10 ft. of cord and attachment plug ready for use on 110-volt, direct or alternating, current. Price, $4—Metal Specialties Co., Inc., 338-52 North Kedzie street, Chicago.

All-Steel Trailers

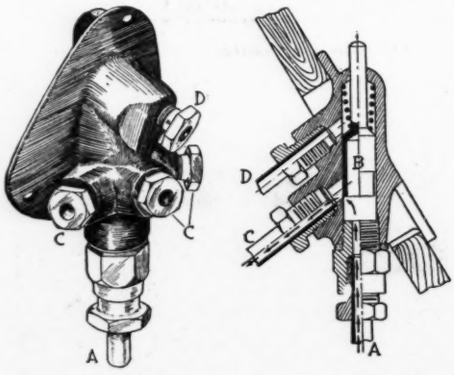
The line of trailers for motor cars and trucks manufactured by Rogers Bros. Co., Albion, Pa., includes two-wheel types, semi-trailers, non-reversible four-wheel trailers and reversible short-turn gear, four-wheel trailers. Capacities vary from 1000 lb. two-wheel type to the heavy, 10-ton semi-trailer and four-wheel type. Extra equipment includes front-end gate drop, rear and front supports, extra connections, extension tongue, mud guards and Rogers quick-detachable coupler. The company lists nine two-wheel models, six semi-trailers, four non-reversible four-wheel and four reversible short-turn gear, four-wheel. Prices range from $95 for the Model B to $1,800 for Model 10-STG, which is a 10-ton reversible short-turn gear, four-wheel trailer.

Woodward Transmission for Ford

The Woodward front-end transmission for Ford cars consists of a four-speed transmission gearbox located under the floor boards and operated by the lever without intermediate or connecting devices. This type is an addition to the Woodward line of Ford four-speed transmissions mounted beneath the rear of chassis. The new type has been standardized so that it can be mounted in either direction. The underdrive assembly gives gear ratios ranging from low, 15 to 1, to high, 3 7/11 to 1, with direct drive on high. All that is necessary to obtain over-drive is to unbolt the transmission, turn it around and bolt it in again. The gear ratios then range from high, 2/11 to 1, third, 3 7/11 to 1, direct drive on third, second, 6 to 1, low, 10 to 1. Both Woodward Rear-End Four-Speeds for Fords and Model Two-In-One are marketed through jobbers and dealers. Price, $60—Woodward Truck Attachment Co., Los Angeles.



Pittsfield airplane type spark plug, made to withstand great heat



Janusch oil circulation indicator and distributor for engines



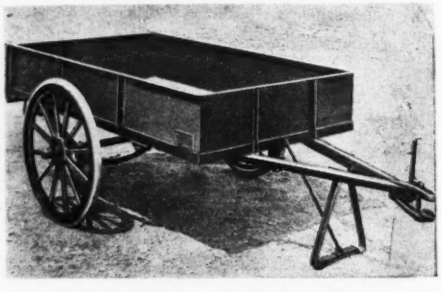
Presto electric heater to keep engine, etc., warm over night

Janusch Circulation Indicator

The Janusch oil circulation indicator and distributor is adapted for use on motor car, tractor and airplane engines. It is made either as an indicator, in which case there is only one outlet, or as a combined indicator and distributor, in which case there are several outlets. Indicators with a single and with three outlets are ready for production. Both models can be mounted on the toe board or instrument board. The sectional view shows the operation: Oil enters at A and flows underneath B. Ordinarily B, the piston, is forced down against the inlet plug by a coiled spring, but the pressure of the oil causes it to rise and uncover the distributor outlets, shown at C. The piston has an extension passing through a hole in the top of the distributor. When no oil is flowing, this extension is entirely within the distributor, but when oil passes through, the extension protrudes ⅜ in. or more. The outlet, D, takes care of oil that leaks by the piston, returning it to the supply tank. F. Janusch's Machine Shop, 509 Roscoe street, Chicago.

Airplane Type Spark Plug

The construction of the Pittsfield airplane type spark plug anticipates development of great heat. The core C is built up of mica washers and has square shoulders. The square shoulders afford two gasket seats, and when the core is clamped in the shell by the check nut E, it is centered accurately and a tight joint is formed. This construction gives a shorter plug than with conical fits, improving the heat radiation through the stem. The lower end of the shell has a baffle plate, O, which tends to keep oil from the mica. Perforations, L, in the baffle plate prevent burnt gases from being pocketed behind the plate and preigniting the new charge. The stem, P, is



One of the smaller Rogers Bros. all-steel trailers



Equi Ford car starter, built entirely on the engine

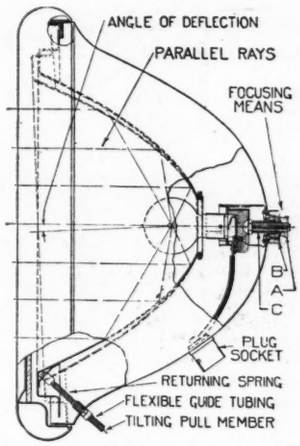
made of brass or copper for superior heat conductivity, and the electrode, J, is swedged in the bottom of the stem, as shown at K. The shell is finned, G, to provide greater heat-radiating surface. A fin, F, at the top of the stem also increases the radiation of heat from the stem and electrode. The top of the finned portion is countersunk slightly and the stem is riveted into it, thereby reducing possibility of leakage past the threads on the stem. The finned portion is necked, A, to take a slip terminal. In building up the core a small section of washers, I, is built up before the mica insulating tube, D, is placed on. This gives a better support to I. Baffle plate, O, is bored to allow the electrode, J, to pass through, and the clearance between the baffle plate and electrode is larger than between the firing points, so there is no danger of spark-jumping from electrode to baffle plate. The plug will be furnished with or without the finned portion. Pittsfield Spark Coil Co., Pittsfield, Mass.

Equi Starter for Ford

The Equi special Ford starter weighs 12½ lb. and is built entirely on the engine to make it unbreakable. The device fastens to the engine, the original Ford transmission case cover plate being removed to permit the installation of the case cover plate of the device. Each starter has an anti-back-fire device, and a pedal operates the starter. A plunger, which acts as a primer, is also part of the starter and when pressed down as the pedal stroke is made, the engine is primed. The plunger, in other words, serves to disengage the pedal and to prime the carbureter if priming is necessary. Price, $20—Equi Light Co., Paducah, Ky.

Motor Diner Outfit

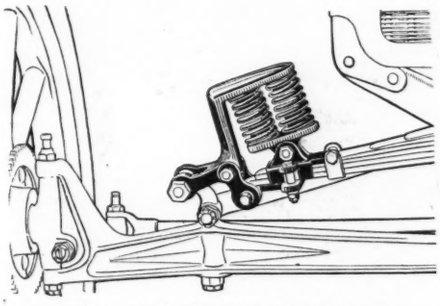
A diner outfit consisting of camp kitchen and cupboard with portable and collapsible dining table attached and camp chairs, made by R. E. Orne, Everett, Wash., occupies a space 12 by 24 in. on the running board and is only 28 in. high. The outfit weighs 40 lb. complete and is of galvanized iron. The space is divided into two floors 6 in. apart. The lower section holds collapsible stove, flat bottom coffee pot, pan in which dishes are packed and frying pan. The top section contains two quart and two pint food jars, two quart Thermos bottles, flour, vegetables, canned goods, pies, cakes, meats and so on. A shelf supports a 9 by 9 by 13 in. food box, and on top of the food box are five camp chairs. Just below the edge of the cover on both sides of the cabinet are hinged table leaves 22 by 24 in. each. Supported at right angles, a table 2 by 5 ft., which accommodates six persons, is provided. The leaves are supported by a leg in the center of each leaf, which packs in a slot in the cabinet. Closed, the leaves form the doors to the cover and are fastened by iron buttons.



Benjamin headlight reflector, controlled from wheel through tilting member

Benjamin Headlight Reflector

A headlight reflector is the latest invention of the Benjamin Electric Mfg. Co., Chicago. The device is controlled from the wheel and limits the light zone to the road through a tilting member. The reflector is pivoted on a horizontal axis, passing through the lamp center and may be held at any desired angle. The highest point of the beam when the reflector is at full-tilted angle is 36 in. from the ground. Full illumination always is obtained from both up and down positions of the reflector. No glare is possible above the horizontal when the reflector is at full-tilt, except momentarily on uneven roads. Even under these conditions the intense beam will be below the line of vision for the driver of an approaching car. The character of light distribution is controlled by the shape of the reflector.



Champion shock absorber, twin coil compression springs of steel

Coal-Oil Fuel System

The Vaporator coal-oil fuel system consists of a three-in-one manifold, intake, exhaust and hot air; a curved strip of heavy gage sheet iron lined with a heat-retaining mineral preparation, which fits over the manifold; and a 1⅓ gal. gasoline tank which fits flatly against the front of the driver's seat, which holds the gasoline that may be required for warming the engine on cold mornings and for emergencies; a substantial, flexible tube for the auxiliary tank; and a section of tubing for the manifold and the radiator overflow connections. It is not always necessary to start with gasoline when the system is warmed thoroughly. The connection between the Vaporator and the radiator overflow insures freedom from carbon by admitting automatically steam to the cylinders whenever carbonization threatens. The Vaporator is designed to work with any carbureter. Price, complete, $16.50—The Vaporator Mfg. Co., 2737 Washington avenue, St. Louis.

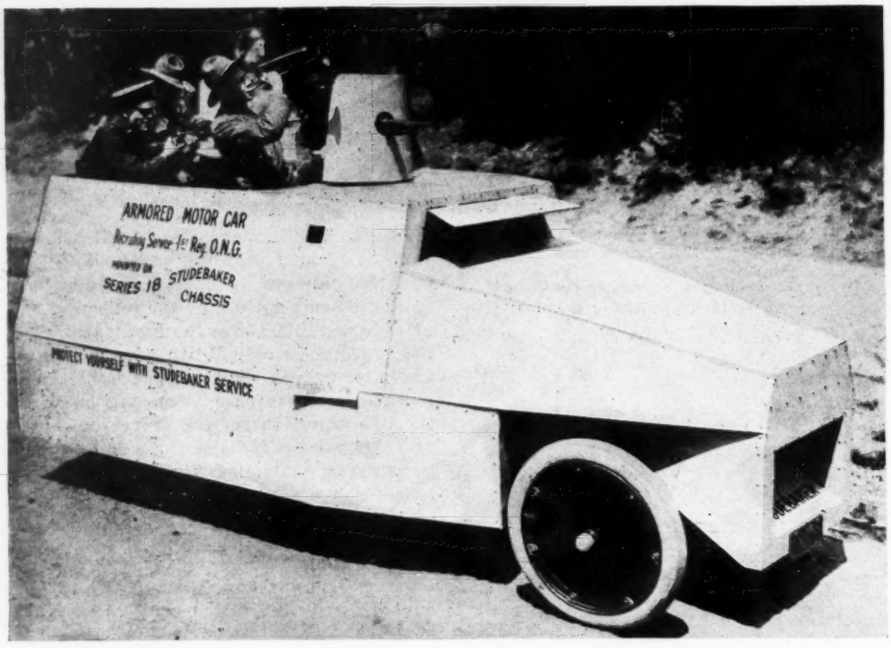


The Vaporator coal-oil fuel system outfit as it comes complete



The motor diner outfit built by a Washington motorist provides kitchen, dining room and pantry for six persons

Among the Makers and Dealers



WHEN DEALERS DEAL IN RECRUITING—Soon after recruiting began for war service the Studebaker dealer at Cleveland had this car built for the local authorities and presented it to Uncle Sam

EDSON Smith with Coast Patrol—Edson H. Smith, formerly district manager of Dodge Brothers, is now with the coast patrol at St. Clair Flats.

Yeats Directs Detroiter Sales—R. T. Yeats has been appointed director of sales and exports for the Detroiter Motor Car Co. He has been on the staff of the company since it was founded.

Bowman to Direct Acason Sales—J. F. Bowman has been appointed director of sales and elected vice-president of the Acason Motor Truck Co. Mr. Bowman formerly was sales manager of the Federal Motor Truck Co.

Dayton Laboratories Studies Traction Ignition—The Dayton Engineering Laboratories Co., Dayton, Ohio, manufacturer of the Delco systems, has inaugurated a special department devoted to tractor ignition problems. Experiments are being made.

Briggs & Sratton Employ Women—The Briggs & Stratton Co., Milwaukee, Wis., makers of coils, magnetos, switches and other electrical devices, has given positions to more than 200 women in its new plant, because of the shortage of men. The positions thus filled formerly were occupied exclusively by men.

Canadian Goodyear Plant Ready—Work on the erection of the new plant of the Goodyear Tire & Rubber Co., New Toronto, Ont., has been completed, and operations have started. The plant cost $1,000,000, covers two acres and took more than a year for completion. It was necessary to build a special waterworks system to supply the factory, and this includes a 90,000-gal. tank for supplying the sprinkler system.

Closes His Business for War Call—Harlingen, Tex., may not be one of the biggest cities in Texas, but it has some of the biggest citizens when it comes to answering the country's call for soldiers. "Wes" Bailey did run a garage at Harlingen, but he heard the call of the flag and declared his car for sale and business suspended. It will not be necessary for him to close the garage, however. "Wes" will go to war, and his mother will run his garage.

Pfaff Becomes Pan-American S. M.—Harry C. Pfaff has been appointed sales manager of the Pan-American Motors Corp. He formerly was Chevrolet distributor in Cincinnati, Ohio.

All Season Body Co. Reorganizes—The All Season Body Co., Marshall, Mich., has been reorganized and will resume manufacturing activities soon. It is stated that plenty of capital has been obtained to assure the continued increased operation of the plant.

Prest-O-Lite Transfers Freidman — M. Freidman, formerly branch manager of the Prest-O-Lite Co. at Kansas City, Mo., has gone to Buffalo, N. Y., to take charge of the branch there. James D. Reynard, who was at the Indianapolis headquarters, has taken his place.

Victor Wheel Leases Temporary Plant—The Victor Wire Wheel Co., Kalamazoo, Mich., has leased the plant formerly occupied by the Gibson Mfg. Co. to use for manufacturing wire wheels until the company can erect its own factory.

Federal Truck Passes Dividend—In line with the cautious policy now being observed by many motor companies, the Federal Motor Truck Co. has passed its dividend declaration. Directors of the company thought that the present uncertain period demanded caution and the withholding of certain assets to meet the uncertain future.

Standard Steel Castings Adds—Standard Steel Castings Co., Cleveland, Ohio, is building a new foundry and machine shop to be devoted exclusively to the manufacture of cast steel wheels. This installation will cost about $350,000, and the melting equipment will include two 3-ton electric furnaces and three 2-ton converters. The output of the new foundry will be 400 wheels a day. The company recently increased its capitalization from $125,000 to $1,000,000.

Modine Mfg. Co. Increases Capacity—The Modine Mfg. Co., Racine, Wis., maker of radiators for motor cars, trucks and tractors, is increasing its capacity from 2500 to 3500 radiators a month.

Australian G. M. Man in U. S.—F. E. Woodell, Australian manager for the General Motors Export Co., is in the United States for a brief business visit. He will return to Sidney from New York via San Francisco.

Oneida Truck to Build Factory Group—The Oneida Motor Truck Co., Green Bay, Wis., will begin work soon on a new factory group costing about $200,000. The plans include a main building, 150 by 300 ft., with a separate boiler house and powerplant and blacksmith shop.

Spark Plug Maker Doubles Output—The Gas Motor Efficiency Co., Janesville, Wis., manufacturing spark plugs and other ignition specialties, is doubling its output by the addition of a full night force. The production of spark plugs has reached 1250 a day of 24 hr.

Seven Years in Chalmers Service—Ed Little of Washington, D. C., has been connected with Chalmers service, both in the factory and with dealers, for the last seven years. He formerly was at Columbus, Ohio, but is now service manager with the Coombs Motor Co., Chalmers distributor for Washington.

Diehl Is Mason Sales Manager—John H. Diehl has been appointed general sales manager of the Mason Tire & Rubber Co. Mr. Diehl has had many years' experience in the business, starting with the B. F. Goodrich Co. in 1894. For the last five years he has been manager of sales for the Portage Rubber Co.

Torbenson Axle Adds to Plant—Torbensen Axle Co., Cleveland, Ohio, is erecting a two-story building, 140 by 110 ft., at a cost of $200,000, to be used exclusively for the production of 3½- and 5-ton axles. In addition to this plant the company is installing a heat treating plant and a power station capable of generating 600 hp.

U. S. Adopts Rust-Proofing Method—The United States Government has adopted the Parker process, owned and controlled by the Parker Rust-Proof Co. of America, and full equipment for the work is being rushed at Rock Island, Ill. The process will be used for all small arms. The process has been used before by the Government in the Panama Canal zone.

VanVeen to Manage Chicago Mason Branch—George C. VanVeen has been appointed manager of the new Chicago district factory branch of the Mason Tire & Rubber Co. Mr. VanVeen also will have charge of sales for the central district. He has been manager of the Kansas City branch since it was opened, and his promotion follows his record there.

Four-Wheel-Drive Adds to Plant—The Four-Wheel-Drive Auto Co., Clintonville, Wis., is making additions to its plant which will increase the aggregate floor space to approximately 120,000 sq. ft. The receiving, stock and shipping departments, now occupying part of the machine-shop, will be housed in a new building, 100 by 120 ft. A new heat-treating room, 60 by 64 ft., is being erected adjacent to the motor testing shop,

and the third new structure, 100 by 180 ft., will be used for finishing and storage of completed trucks.

Limousine Top to Make Roamer Bodies—The Barley Motor Car Co. has contracted with the Limousine Top Co. for sedan bodies for the new model Roamers.

Bursner Becomes American Motors Treasurer—Robert B. Bursner, Cleveland, Ohio, has been elected treasurer of the American Motors Corp., New York.

Motor Parts Takes Exclusive Selling Right—The Motor Parts Co., Philadelphia, Pa., has obtained the sole selling rights for the Ford starting and lighting equipment made by the Westinghouse Electric & Mfg. Co. The territory is being redistributed, and a heavy campaign is well under way.

Some Recent Empire Changes—Harry R. Lock has been appointed manager of the Buffalo branch of the Empire Tire & Rubber Co., succeeding R. H. Paddock, who went to Boston. W. H. Chadwick, at Boston for many years, will be in charge of mechanical sales in the New England states hereafter.

Ballentine to Advance Rumely Co.—W. I. Ballentine, Milwaukee, Wis., has resigned as superintendent of the Chain Belt Co., Milwaukee, to accept the position of vice-president and general superintendent of the Advance-Rumely Co., tractor engine maker, Laporte, Ind.

Poyer to Manage Republic Assembly Plant—D. F. Poyer has been appointed manager of the Republic Motor Truck Co. assembly plant recently purchased in Los Angeles, Cal., at a cost of $150,000. The plant will employ 125 men to start with and will supply Republic trucks for shipment to South America, Asia, Australia and the Pacific coast.

Miller Business Unharmed by War—Business for the Miller Rubber Co., Akron, Ohio, between Jan. 1 and Aug. 1 of this year amounted to $6,605,000, as compared to $3,599,000 for the same period last year. This amounts to an increase of approximately 85 per cent and indicates that the company's business has not been affected adversely by war conditions; in fact, President Jacob Pfeiffer estimates that the total sales for the current year will be between $10,000,000 and $12,000,000.

Amsterdam Company Adopts Pierce Governors—The Minerva Motors Co., Ltd., of Amsterdam has adopted Pierce governors, made by the Pierce Governor Co., Anderson, Ind., as standard equipment on its motor trucks and lorries. This is the most important foreign contract closed by the Pierce company, as the Minerva Motors Co., Ltd., is among the largest and best known motor manufacturers in Europe. The Amsterdam company will require about 5000 governors during the next twelve months.

Ovens Increase Maibohm Production—A considerable increase in the production schedule of Maibohm sport roadsters already has resulted from the enameling ovens and the additions to the body-building department just completed at the plant at Racine, Wis. It is expected that the output will be more than doubled within a short time. The ovens have cut in two the production time per car. The new enameling equipment is particularly important to the custom color jobs which are an essential feature of Maibohm sport cars at the regular price of $795.

Heil Co. to Increase Capacity—The Heil Co., Milwaukee, Wis., operating a tank and boiler works, has started construction work on additions which will make it one of the largest makers of motor dump-truck bodies in the world. The main addition will be a steel and brick shop, 130 by 200 feet, equipped with electric welding machinery, a 3-ton and a 5-ton electric crane, to cost about $100,000 complete. This shop will be devoted exclusively to the production of motor truck bodies by the electric welding process.



INDIA MAKES CARS INTO LORRIES—Overlands figure in this railway workshop at Bombay, where cars are transformed into light lorries for military use. This is a common practice now in India

Goodyear Appoints Branch Managers—Wade V. Aydelotte, formerly staff man for the motor truck tire department of the Goodyear Tire & Rubber Co., Akron, Ohio, has been made manager of the Newark, N. J., branch. A. W. Ellis has been transferred from Louisville, Ky., to Long Island City, N. Y., as assistant branch manager. H. T. Roseland, formerly manager at Phoenix, Ariz., has been appointed manager at El Paso, Tex., succeeding T. J. Fitzgerald, who has been called into Federal service. D. W. Sanford, general line salesman at Phoenix, succeeds Mr. Roseland.

Cornell Leaves Empire Rubber—A. Boyd Cornell, for fifteen years secretary of the Empire Tire & Rubber Co., New York, has resigned. Harvey R. Nason, for many years with the company, has been elected to succeed Mr. Cornell.

Pennsylvania Rubber Declares Dividend—The Pennsylvania Rubber Co., Inc., Jeannette, Pa., has declared the regular quarterly dividend of 1¾ per cent on preferred and 1½ per cent on common stock, payable Sept. 29 to stock of record Sept. 15.

Monitor to Build New Factory—The Monitor Motor Car Co., Columbus, Ohio, which recently increased its capital to $1,000,000, has bought 25 acres on which to build a factory. The plans call for the immediate construction of two one-story brick structures, each to have 100,000 sq. ft. of floor space. Other buildings will be erected later.

Trailer Company Stages Tour—Two representatives of the Auto Kamp Equipment Co., Saginaw, Mich., are on a 10,000-mile trip, across the continent and back, to demonstrate the company's product. The trip is to last six months and will almost circle the continent, taking in California on the west, Florida on the south and New York on the east.

Broad Becomes Stanley Chief Engineer—C. E. Broad, who rejoined the engineering staff of the Stanley Motor Carriage Co., recently after an absence of seven years, has been made chief engineer. In gasoline car circles, Mr. Broad is best known for his work in truck design for the Packard. He has been active in steam passenger car and truck design for twelve years.

F. B. Ansted Heads Lexington-Howard—Frank B. Ansted has been elected president of the Lexington-Howard Co., Connersville, Ind., to succeed his father, the late Edward W. Ansted. He will continue as general manager, a position which he has held six or seven years. Emery Huston, for several years advertising and assistant sales manager, has been made vice-president to fill Mr. Ansted's place. Mr. Huston also will continue his former duties.

Coming Motor Events

CONTESTS

Sept.	6—Red Bank, N. J., track race.
*Sept.	15—Providence, R. I., speedway race, championship.
Sept.	22—Chicago speedway race.
Sept.	28—Trenton, N. J., track race.
*Sept.	29—New York speedway race, championship.
Oct.	6—Danbury, Conn., track race.
Oct.	6—Uniontown, Pa., speedway race.
Oct.	15—Richmond, Va., track race.
*Oct.	13—Chicago speedway race, championship.
Oct.	27—New York speedway race.

*A. A. A. championship award event.

MEETINGS

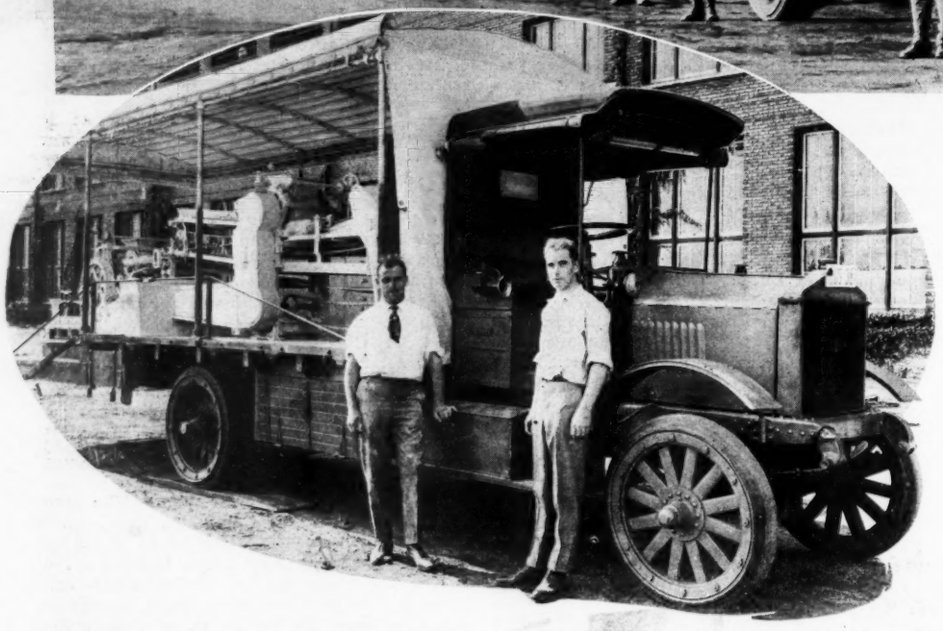
Sept. 12-14	Atlantic City, N. J., Motor and Accessory Manufacturers, mid-season meeting.
Oct. 9-11	Pittsburgh, Pa., National Association of Purchasing Agents, annual congress.

SHOWS

Sept. 2-9	Spokane, Wash., Interstate fair.
Sept. 9-15	Milwaukee show, State Park fair, West Allis, Wis.
Sept. 17-24	Grand Rapids, Mich.
Sept. 22-29	Chicago, Ford accessories.
Oct. 1-6	Buffalo, N. Y., closed cars.
Oct. 13-28	Dallas, Tex., state fair.
Nov. 12-18	Denver.
Jan. 5-12	New York.
Jan. 19-26	Montreal, Canada.

From the Four Winds





BREAD AND SHOES ASSURED—These two army trucks promise bread and shoes. The shoe truck comprises a Kelley-Springfield truck with trailer fitted up with the most modern machinery for shoe repairing given to a Massachusetts brigade. The unit has a capacity of from 200 to 300 shoes a day.

The bread machine, while under army observation, is still civilian. Sanitary features mark it. Capacity ranges from 1000 to 6000 loaves an hour and will turn out this work of 112 men now with five men. The outfit weighs 3 tons and is mounted on a standard 3½-ton Selden truck with auxiliary water supply to assist in radiation. The truck's engine operates the machinery, though there is an electric motor.

THIRTY Dealers Show at Columbus—Machinery Hall at Columbus, Ohio, was crowded with the exhibits of the thirty dealers taking part in the motor show held at the Ohio state fair last week. In all 150 models of cars and trucks were in display. The Columbus Automobile Show Co. had charge of the show, and W. H. Payne was manager.

Winnipeg Estimates Its Car Upkeep—A Winnipeg statistician has gone to work and figured out that it costs something like $7,000,000 to maintain the $20,000,000 worth of motor cars in Manitoba. Chauffeurs get $20 a week or more, and the salary bill for the year runs to $525,000. Other expenses of upkeep are listed as follows: Lubricating oil, $60,000; gasoline, $500,000; tires, $3,750,000; repairs, $200,000; anti-freeze, $20,000; garage fees, $2,000,000.

Dixie Highway Boosters Push Work—Dixie Highway promoters at a meeting in Richmond decided to resume efforts to raise $50,000 by subscription to complete the eastern route in Laurel and Rockcastle counties. Cincinnati has agreed to raise $20,000, and each county in Kentucky and Ohio along the route is assessed a certain portion. It will require $100,000 to do the work, and both Laurel and Rockcastle have reached the limit of their ability to finance road building. Between 20 and 30 miles remain to be finished, with a bridge over Rockcastle river, near the mouth of Parker creek. The counties, after two years' controversy, have agreed upon the route to the point where their respective roads join.

Atlanta to Show Cars at Fair—A motor show will be held at the same time as the Southeastern fair at Atlanta, Ga., this year, and a concrete building, 100 by 200, is being built for the exhibition. The Atlanta Automobile Trade Association has leased for three years the entire space in the building. The Southeastern fair is to the Southeast what the Dallas fair is to the Southwest, and a large attendance is anticipated for this reason. The show will be held Oct. 14-20.

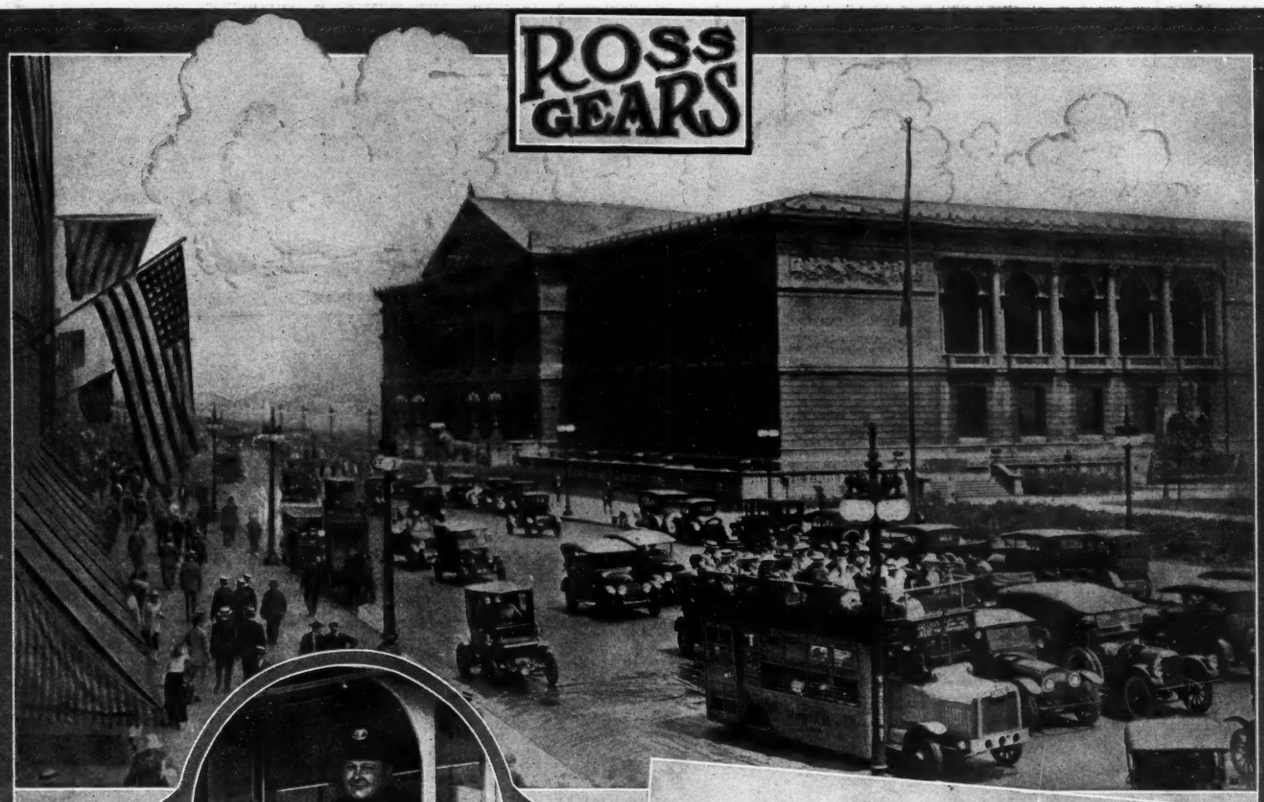
Minnesota Show Bigger and Better—More space than ever before has been sold this year for the annual motor show at the Minnesota state fair, Hamline, Minn., between the Twin Cities. An addition of 40 by 98 ft. has been added, giving the car the entire ground floor of the Varied Industries building. Still more space has been obtained for cars and trucks in buildings belonging to the farm implements and machinery division. The fair dates are Sept. 3-8, and there are more than forty exhibits.

L. H. Cutoff from Salt Lake West—An all-year cutoff from the Lincoln highway has been sign-posted by the Automobile Club of Southern California from Salt Lake City to Los Angeles. Because of deep snows and blocked roads it is impossible to traverse the highway west of Salt Lake throughout the year except via Southern California. The last extension of the work has been from Ely, Nev., eastward to the Utah metropolis.

Three Counties Worth Noting—Mississippi, Scott and New Madrid Counties, Missouri, are attracting the attention of the whole state with the adoption during the last few weeks of bond issues for road and bridge improvements amounting to $375,000, $750,000 and $800,000 respectively. This sum, $1,925,000, will be in addition to state and Federal funds. All three counties are in what is called Swampeast Missouri.

Province of Alberta Organizes—The motorists of the Province of Alberta, Canada, have organized the Alberta Motor League. Representatives from all over the province attended the first meeting. Lieut.-Governor Brett was chosen honorary president and W. F. W. Lent, permanent chairman and president. Alberta now has about 18,000 cars, while the prairie provinces have 52,000.

ROSS GEARS





"*Yes*," says the "contented driver" of one of the fifty new motor busses in Chicago, "it's wonderful how easy they are to steer, even in the heaviest traffic on Michigan Avenue."

The secret, of course, is ***Ross Steering Gears.*** When the Gas-Electric Motorbus Corporation considered the question of steering equipment for their new motor omnibusses, ***Ross Gears*** were chosen, because the number of passengers these busses are designed to carry and the congested traffic through which they must run, makes vitally important the ***safety, reliability*** and ***easy operation*** which are assured by the design and quality of Ross Gear construction and workmanship.

For the same fundamental reasons, 115 manufacturers of motor trucks, representing considerably over half the entire industry, use Ross Gears as standard equipment.

Write for catalog and further information about "The Steering Gears that ***Predominate*** on Motor Trucks."

ROSS GEAR & TOOL CO.

400 Heath Street

Lafayette ·· Indiana

GAS-ELECTRIC MOTORBUS CORPORATION

MAKER OF MOTOR OMNIBUSES EXCLUSIVELY

NEW YORK

Ross Gear & Tool Co.,
Lafayette, Ind.

July 16, 1917.

Gentlemen:

The busses in Chicago have only been in service a little over three months. However, the writer has had actual running experience with this gear for several years, and has never known or heard of a "B.F." steering gear that has given appreciable trouble.

Yours truly,

GAS-ELECTRIC MOTORBUS CORPORATION

CCB/S



Why Does the U.S. Navy Specify SCHEBLER?



WHY are the officer's tenders, and general service lighters of the U. S. Navy equipped with SCHEBLER Carburetors?

For the same reason that SCHEBLER is used as standard equipment by leading manufacturers of fire engines, fire insurance patrols, police, hospital and army ambulances. For the same reason that the mounts of motorcycle police squads in every important American city are standardly SCHEBLER-equipped.

And that reason is uniformly dependable performance **over the long stretch.** SCHEBLER is not a sensational carburetor—simply a common-sense carburetor.

The Wheeler-Schebler Carburetor Co., Inc.
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